this respect A. largely bases his interpretation on F.D. Razi’s and Tusi’s Commentaries on I.S.’s Isharat;
2. I.S.’s criticism - in the line of Aristotle - of the contention that matter is the nature of things;
3. I.S.’s failure to formulate a substantial criticism of Democritus’ theory on coincidence;
4. I.S.’s rejection of the *ku(mi)*-theory of al-Nazââm;
5. I.S.’s acceptance of the unity of movements, proving it out of the unity of form;
6. I.S.’s attributing a kind of material meaning to the present time;
7. I.S.’s refutation of the existence of the void;
8. I.S.’s distinction between natural and violent inclination.
A. offers a good summary of the Sunna ‘at-Tâbi’in of the Shi‘a, but of a rather general, and sometimes even redundant kind. Nevertheless, one may find some interesting insights.


Authors refer to (sometimes lesser known) works of I.S. in order to demonstrate that he is fundamentally a defender of the natural sciences. It is note-worthy that authors mention a certain R. B. taqsin al-mawjûdât, Tr. on the Division of the Existent Beings (as far as can be determined, not mentioned by Anawati, nor Mehdavi).
A good, but somewhat unilateral approach of I.S.’s thought.


Heisenberg’s concept of matter forms the central issue of this paper. I.S., Averroes and Thomas Aquinas are presented as having somehow prepared the way to Heisenberg - the problem of mixture remaining their major difficulty.
A.’s explanation of the ‘Datur formae’ (sic) cannot but surprise, insofar as the Giver of the form(s) is identified with God Himself.

After a general description of the introduction and of the development of the different sciences in the Islamic civilization before I.S., A. specifically concentrates on some major scientific ideas of I.S., esp. on chemistry (A. stresses I.S.’s rejection of alchemy) and on physics (A. briefly presents the most striking opinions of I.S., as expressed in the Shi‘a, *Libri Naturalis*, b. 2, 4, 5, 7 and 8). A. concludes that I.S.’s scientific research was based on observation and experimentation.
A meritorious introduction to I.S.’s scientific insights - but, for a different evaluation of I.S.’s basic scientific attitude, see 3 and 6.


A. develops a comprehensive survey of natural sciences in I.S. Aside from some of I.S.’s most important physical and chemical ideas, special attention is paid to his concept of natural science per se. Especially with respect to the idea of scientific investigation, I.S. adopted a highly personal position - outgrowing the classical Aristotelian concept which he adhered to in the very beginnings of his scientific thought. Acc. to A., that novelty is no less than the experimental method! So, A. discovers many ‘modern’ scientific insights in I.S. He does not even hesitate to declare that I.S. approaches very closely the Kántan doctrine on the status of metaphysics and science. He also accepts a close relationship between I.S.’s and Descartes’ concepts of extension (a fact which seems partially justified, in so far as I.S. attributes extension to matter). At the same time, A. tries to convince the reader of the Qur‘anic-based character of a great part of I.S.’s scientific insights.
A. falls clearly victim to his pre-conceived thesis that I.S. has to be considered a real and unique precursor of modern science.

Acc. to S., A. considers I.S. to be a systematizer of the classical heritage, but also and innovator in some specific scientific fields.

A. presents I.S. as having introduced many original ideas in different scientific
disciplines (geology, meteorology, etc.), but he offers no precise textual basis for such claims.
A. clearly overemphasizes I.S.'s originality!

A. surveys I.S.'s mathematical theories (based on the Ṣif′ā). He insists that I.S.'s geometrical text is not an abridgement, but a paraphrase of Euclid's Elements (A. sustains his thesis by referring to I.S.'s additional definition of irrationals). He also stresses I.S.'s critical attitude towards the Pythagorean astronomy, and discusses at some length I.S.'s curious note about his alleged observation of the disk of Venus. Having dealt with I.S.'s mathematics, A. proceeds to examine I.S.'s physical opinions, at least three of them: his refutations of both alchemy and astrology and his theory of vision. Acc. to A., the latter is an explicit restatement of Aristotle's theory, while I.S.'s refutations of alchemy and astrology appear to be confused.
Regarding mathematics, valuable, but with respect to physics highly incomplete, and, no doubt, less convincing.


A. portrays I.S. as a model of the 'modern' scientist - exalting I.S.'s "empirical bent of mind". A. tries to show this by citing several of I.S.'s scientific theories from different domains.
A. indicates some interesting features of I.S.'s scientific thought, but he bypasses important 'conservative' elements in it.


24-25: A. offers a profound and philosophically significant structural analysis of both works.
B.1. Mathematics


(2) DAFIF (AL-), A. and STROYS, J., Ibn Sinâ as a Mathematician, in: Ibn Sinâ. Doğumunun... 67-140.

Having reviewed I.S.'s mathematical education according to the latter's famous autobiography, authors examine critically which mathematical texts may be properly ascribed to him. Then they present and analyse I.S.'s major insights concerning arithmetic, geometry, trigonometry and foundation of mathematics. Special attention is paid to the possible sources, authors specifying them as follows: Nichomachus of Gereza, and some Indian sources (arithmetic); al-Hajjâ or Ishâq-Tâhibī (geometry, in fact, authors feel unable to make a final choice, but they afford most valuable information and suggestions); al-Fârâbî (trigonometry - unfortunately, authors did not use the Cairo-edition of this part of the Shifâ, published in 1980 - see Works, A II), Aristotle, most probably mediated by al-Kindi and al-Fârâbî (foundations). In their final conclusion authors observe that I.S.'s interest in mathematics is not so extremely philosophical as Sarton has claimed. In fact, I.S. occasionally improves on his sources. Moreover he has often a fixed, practical purpose (e.g. the arithmetic of the Dâncheh-Nâmeh, Book of Science, as an introduction to musical theory). Nevertheless, authors agree that mathematics formed only one of I.S.'s multiple occupations, and, indeed, not the most important one.

A very fundamental paper on I.S.'s mathematical ideas.

(3) LODZIEV, I., see: KAIHOROV, A.


A. points out the fact that I.S. incorporates mathematics completely into the philosophical realm - notwithstanding his total agreement with the traditional view on the status of mathematics. A. also observes that I.S. distinguishes between Arithmâtîq, the classical study of natural numbers, and Hisâb, the study

of numbers which supposes an instrumental or applied aspect, including inter alia algebra. Now, in order to account for the object of the algebrists, i.e. the 'thing', an ontology other than Aristotle's is needed. It was indeed developed after al-Fârâbî, and was presented by I.S. in a very systematic way, where he declared the thing, together with the existent and the necessary, to be notions given by immediate evidence. A. no doubt points out an important fact, but, unfortunately, he does not really elaborate on this famous new ontology.


A. characterizes I.S.'s Usâl al-handasa as an example of Euclid's Elements. However, his main focus is the reception of Euclid's text in classical Islamic culture - esp. the problem of the different translations, and the differences in figures mentioned (A. pays in this respect particular attention to Tâdil). A. concludes that in the actual state of affairs the precise Arabic source for I.S. cannot be determined. A. poses well the complex problem of the precise source of I.S.'s geometry.


(8) STROYS, J., see: DAFIF (AL-), A.


See also: A 1, 9, 20, 24.
B.2. Music

A. starts his paper by indicating the place of music among the mathematical sciences. Hereafter, he discusses the origin of Oriental music - stressing the Iranian contribution to it. Although A. accepts that the foundation of I.S.’s theory of intervals and degrees of harmony lies in a Greek-inspired cosmological model, he is also convinced of a typical Iranian-Islamic impact on I.S.’s theory of music, at least with respect to the concept of harmony. It may be noted that for A., the exposed of the Shi‘a, *The Cure forms the common ground of all of I.S.’s musical treatises*. A. gives a list of ms. of this part of the *Shi‘a* - unfortunately in a not very precise manner.
A. offers a good basic analysis of I.S.’s theory of music.

A. first develops the fact that one can distinguish two tonal systems in the classical Arabic treatises on music: one of autochton origin (but almost nothing is known about the beginnings of this music) and another of Greek origin (mediated by Byantnian, Coptic and Persian sources). With respect to I.S., A. analyzes the general theoretical foundation of his theory of music (mainly pointing to (Neo-)Pythagoric, Aristotelian and Platonic ideas), as well as its object and its formal structure (using very different sources for the different subsers of that structure).
A. very interesting paper, in which A. expresses himself in a very cautious way about the probable historical sources of I.S.’s musical theory.

Note: Dzhumaev is sometimes also spelled: Gemaev.

A. concentrates on the social and aesthetic aspect of I.S.’s theory of music. He hereby pays special attention to I.S.’s attitude towards his Greek predecessors (esp. Pythagoras), as well as to his Arabic predecessors, or contemporaries (esp. Ruhfī al-Sīfā, al-Farābī and al-Brīkān). Acc. to A., I.S.’s theory of music was inspired by a physical approach (and hence, not based on the movements of the heavenly spheres). Moreover, music was presented by I.S. as a means of physical therapy (esp. in the field of psychosomatics). Valuable, although of an introductory kind.


Based on the opening section of I.S.’s introduction to his *Book of Music of the Shi‘a*, A. shows inter alia I.S.’s (relative) independence from the ancients, I.S.’s rejection of a Pythagorean-type approach to music-theory, and I.S.’s holding a fundamental separation between the musical and the extra-musical domains. A. characterizes I.S.’s approach to music as close to what we call nowadays an aesthetician approach (but I.S. does acknowledge the therapeutic value of music).
Although music has biological and social functions, it is above all a source of enjoyment. Moreover, although I.S. recognizes with Plato, that music is imitative, he, unlike Plato, does not consider imitation to be a central characteristic of music. For I.S., it is the structural or formal aspect of music that is the source of the greatest delight.
A valuable case-study having several basic ideas in common with 4, which A. seems to be unaware of.


A. observes that I.S.'s approach to music is very similar to al-Fārābī's. I.S. elaborated a sophisticated adaptation and development of material derived from the Greek theorists (empirical observation playing almost no role). Concerning rhythm, I.S. took his main analytical tools from the Arab science of prosody, while his doctrine of melody seems to represent an interesting transitional phase between the early diatonic system and the later system of Saff al-dīn Ormānī. A. provides the reader with a valuable basis for further investigation on I.S.'s theory of music.

C. Physics

(1) AKHMEDOV, A., see: SIRAZHDINOV, S.


A. informed me that the name of I.S. is not mentioned in this summary, but that a paper of him, entitled: "(Al-)Chemical Foundations for Cosmological Ideas: Ibn Sinâ on the Geology of an Eternal World" is in print.

(4) GODDU, A., Avicennas, Avempace and Averroes - Arabic Sources of "Mutual Attraction" and their Influence on Medieval and Modern Conceptions of Attraction and Gravitation, in: *Orientalische Kultur und Europäische Mittelalter*, 218-239.

A. states that I.S., contrary to Aristotle, left open the possibility of action at distance, by holding an innovative view on causality and matter. In fact, I.S. defended the immediacy of cause and effect in physical processes, and tried to develop a positive view of matter, which enabled him to elaborate a unified vision of the cosmos. Out of these basic assumptions I.S. deduced that if bodies were scattered in space, they naturally would tend to cohere - their magnitudes and their reciprocal distance being determinant factors in this process. The remaining part of the paper is devoted to further historical developments in the idea of motion at distance (beginning with Avempace and Averroes through Einstein).

It has to be noted that A. always uses the medieval Latin translations of I.S.'s texts. Unfortunately, for the *De Caelo* he uses the pseudo-Avicenna of the Venice-1508 edition. A. offers some interesting insights.

(5) HASNAoui, A., La dynamique d'Ibn Sīnā (La notion d'inclination : *mayl*), in: *Etudes sur Avicenne*, 103-123.

A. points to the fact that the notion of *mayl* is always linked in I.S. with the nature of things. He, hereafter, carefully distinguishes the ways in which I.S. uses this notion - the larger part being devoted to the study of *mayl qasrī*, violent
inclination. In a last part, A. convincingly demonstrates that the acceleration of natural movement is due in I.S.'s eyes to the production of different mays in the motive force. A very well-documented study of one of the most central notions of I.S.'s dynamics.


(7) MATVIEVSKAYA, G., see: SIRAZHDINOV, S.

(8) SAIDMURADOV, M., see: ZIKRILAEV, F.


A. observes that Philoponus is the first thinker, who claims that the hurled body acquires a motive power from the throwing agent, and that this power, not the ambient medium (as held by Aristotle), secures the continuation of the motion. However, he considered this impressed virtue as temporal. Now, I.S. probably for the first time in history, attributed a permanent character to it. Since Buridan holds some similar concept, it seems natural to consider I.S. as a forerunner for the latter. And, indeed, there is a close resemblance between some expressions and/or ideas, as presented by I.S. in the *Physica* of the Shïfi, and Buridan's wording. A. very carefully remarks that some of them were not available in Latin translation at least as far as one can actually discover. Moreover, he offers a most critical and balanced evaluation of the significance of I.S.'s contribution stressing its fundamental failure to mathematize dynamics, but also to the presence of some significant new ideas in it - even if most of them were still in need of further development (Buridan having done a great job in this respect).

A very fine paper, in which A. consciously avoids making too many unilateral judgments.


Probably a summary of 9, although it may give some complementary information.


A. stresses that I.S. adopts a basic Aristotelian approach in his meteorological theory, although he sometimes adheres to other, more 'modern' views (A. refers to such authors as Theophrastus, Olympiodorus, and al-Kindî). Moreover, I.S. on several occasions takes clearly into account his own observations. All this is illustrated by a basic description of I.S.'s major meteorological ideas, i.e. his opinions on rain, wind, thunder and lightning, and meteorites (as well as related phenomena).

A very valuable survey of I.S.'s major meteorological ideas - paying attention to their (possible) sources.


A. claims that I.S. has invented one of the two possible valid arguments one may express against the finpos-atomic hypothesis. In order to offer a better understanding of I.S.'s argument, A. develops a large historical survey of the most important anti-atomistic theories before I.S., esp. Zeno, Plato and Aristotle, presenting with each a refutation (for Zeno, out of Ash'arite metaphysics; for the others, out of contemporaneous considerations). Then, he analyzes three arguments of I.S. against the finpos-atomic hypothesis, two of which he declares valid. According to A., one of the valid arguments is unique to I.S. (Ghazzûl should have developed in greater detail the second - A. ignores, however, that Ghazzûl's Maqâlid is a slightly reworded translation of I.S.'s Dánešh-Nâme. *Book of Science* (see Works. A III, 3, 2). The basic idea of A.'s work is tempting, but his analysis of I.S.'s thought is incomplete, insofar as he neglects the Dánešh-Nâme.


Having summarized the pre-philosophic, the Greek and the pre-Avicennian Arabic theories on space, A. presents and analyzes I.S.'s theory on this topic. From the rich contents, we may cite:

1. I.S.'s fidelity to Aristotle in his basic definition of body;
2. I.S.’s clear distinction between the logical, the mathematical and the physical analysis of space;
3. I.S.'s well-founded criticism of all theories which deny space;
4. I.S.’s reflecting the “transmitted” Plato, not the “historical” Plato (as regards
such a basic notion as that of *hayyāl*).
5. The existence of different definitions of place in I.S. (some of them lean more on al-Kindī than on Aristotle);
6. I.S.’s establishment of 4 sensible and 3 intellectual proofs in order to reject the existence of the void;
7. I.S.’s introduction of the notion of violent inclination (based on some ideas of John Philoponus).
A pioneering, and, no doubt, valuable work - although sometimes too paraphrastic.

(16) USMANOV, M., see: ZIKRILLAEV, F.

A. describes in rather general terms some basic physical concepts in I.S., e.g. power, time and movement. A. notes that I.S. hardly manages to rid himself of the errors of Peripatetic physics. A. also stresses that for I.S., contrary to Aristotle, the ultimate Being is a remote cause for the material aspects of the world.
Good - introductory.

A. detects three major differences between I.S.’s and Thomas Aquinas’ interpretations of Aristotle’s concept of *physis* (this latter is together with Plotinus’ concept of nature the object of study of the first part of the paper). The first difference concerns nature as a cause of natural motion. I.S. makes the form of bodies responsible for the material movement of bodies, whereas Thomas considers this very same form to be only a principle by which bodies move naturally and spontaneously (Wallace, in his comment analyzes Galileo’s position with respect to this first aspect of nature). The explanation of substantial change gives rise to the second difference. Thomas, contrary to I.S., does not need the postulation of a *Dator formarum*. Finally, there exists a direct opposition between the Aristotelian determinism and the Thomistic indeterminism. A. concludes that the opposition between I.S. and Thomas is basically the same as the contrast between Plato and Aristotle.
No doubt, A. brings to the fore some important differences between I.S. and Thomas Aquinas as concerns their respective concepts of nature, but does this automatically imply that it is the only valid interpretation of the historical Aristotle, as A. seems to suggest?

A. stresses the dualistic character of I.S.’s theory of movement - at its best illustrated by the division between heavenly and sublunar movements. Moreover, A. observes that I.S. makes a principal distinction between movement and emanation. A. concludes that I.S. adheres to a Neo-Platonic interpretation of Aristotle’s philosophy of nature, however not without creating some ambiguities.
A good, but not very original paper.

See also: A 1, 7, 9, 11, 12, 14, 20, 21, 24.
D. Optics

(1) AKDOĞAN, C., Avicenna and Albert’s Refutation of the Extramission Theory of Vision, ibid. Stud., 23, (84), 151-157. A. enumerates different arguments, developed by Albert the Great against the transmission theory of vision, which are closely related to I.S.’s refutation of such theories of vision. A. outlines some primary indications concerning a possible dependence of Albert on I.S. with respect to the refutation of the extramission theory, but further investigation is required in order to fix its exact nature.

(2) BASTAIS, M., “Similitudo sensibilis” chez Aristote, Avicenne et S. Thomas, in: L’homme et son univers au moyen âge (Actes VII Congr. Int. de philos. méd.), 2 vol. Louvain-la-Neuve, Inst. sup. de Philos., 1986, II, 554-559. A. shows that Aristotle’s theory of action, interpreted by the Stoicist through the dyad agens-patientia in terms of ‘similarity’, evolved in the Avicennan Latinus into a theory of “similitude of assimilation” - a theory accepted by Thomas Aquinas. As to “vicarious similitude”, A. outlines the different schemes of view of the three authors under consideration, noting that Thomas represents an intermediary position between Aristotle and I.S. Although Aristotle and I.S. agree on the double immateriality present in the act of knowledge, there are some significant differences in accentuation between them. So, I.S. affirms light to be the cause of the visibility of colour, and accords to the diaphanous character of the eye a sole a transformation in the process of vision. Finally, A. points to the particular importance of the concept of similitude in both of its forms to the theory of causality. By having interpreted the Aristotelian theory of causality in terms of similitude, I.S. has permitted Thomas to effectuate a relative synthesis between Aristotelian and Neo-Platonic causality, although the latter does not recognize the reality of the optical image. A highly condensed, yet a most significant study, offering an important complement to 3.

(3) ID., Sur quelques aspects de la doctrine de la vue dans le “De Anima” d’Avicenne, in: Ann. Inst. Philos. (Bruxelles), 1976, 25-44. A. offers a very detailed analysis of I.S.’s exposition on sight, as presented in the De Anima of the Shi’i - using mainly the critical Latin edition of S. Van Riet (see Works, A. A. 4: Lai, but taking into account, when necessary, the important variant readings of the Arabic edition of Rahman). A. carefully explains the

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significance of I.S.’s major concepts in this field. He also points judiciously to the main anti-materialistic stream of I.S.’s doctrine of vision - reflecting a fidelity to Aristotle, and at the same time a strong opposition towards Galen and Euclid. Moreover, in order to explain the phenomenon of vision, he does not hesitate to employ the essential features of I.S.’s cosmology - stressing the strong similarity between the role of the sun in the process of seeing and the role of the Agent Intellect in the process of knowing. Finally, A. brings to the fore some of the most significant differences between I.S. and Aristotle (giving some corrections and additions to Najīd’s observations in this respect (see Psychology and Psychology, 19)). A remarkable and no doubt very fundamental study.


A. is inclined to believe that I.S.’s exposé on sight in the De Anima functioned as an independent treatise before its incorporation into the larger context of I.S.’s main psychological work (A. makes use of the 1508-ed. of Venice). No wonder, he characterizes it as being of a most personal kind. Therefore, A. tries to clarify as much as possible the basic notions involved in I.S.’s theory. He concentrates very specifically on I.S.’s theory of colours, and pays also great attention to the historical sources I.S. dealt with. Finally, A. declares that I.S.’s doctrine of light and sight in the De Anima forms in fact a preliminary to his “oriental” metaphysics of light. A serious study, containing many valuable insights and offering very useful information, complementing in some respects 2-3, but questionable regarding its affirmation of an Oriental metaphysics (see Religious Themes and Mysticism, C 11).

(5) LINDBERG, D., The Intermission-Extramission Controversy in Islamic Visual Theory: Alkindi versus Avicenna, in: P.K. MACHAMER and R.G. TURNBULL (Eds.), Studies in Perception, Columbus, Ohio State Univ. Press, 1978, ch. V., 137-159. A. wants to dispel the rather common opinion that the classical intermission-extramission controversy was based on simple-minded arguments. In order to do so, he critically analyzes the historical, differing theories of al-Kindī and I.S., while the former made greater efforts to demonstrate the validity of the basic postulation of Euclid’s extramission theory, the latter looked after strong rational arguments in favour of Aristotle’s point of view. In this latter respect, A.’s exposé shows many affinities with Bertola’s (see supra, 4), although offering a somewhat different systematization. However, A. makes in his conclusion a very personal and, no doubt, significant remark, which runs as follows: whereas al-Kindī and the extramissionists always argued on mathematical grounds, I.S. always made use of physical and psychological arguments. A. adds that I.S.’s critics were from the physiological point of view indeed devastating.
This study resembles in many respects 4. However, it has some new insights in addition to it (and also in addition to 2 and 3).


Having briefly, but clearly reviewed Ibn al-Haytham’s contribution to the geometrization of physiological optics, A. points to a surprising assumption present in Ibn al-Haytham. It poses as the basis of visual perception images formed on the anterior surface of the eye-lens. This assumption calls for a striking resemblance with I.S.’s conception of the visual image. Moreover, one discovers in both cases almost the same fundamental error: a confusion between virtual and real image. Now, in so far as this error fits in more conveniently with I.S.’s ideas, one may reasonably suppose that they influenced Ibn al-Haytham. Acc. to A., there also exists historical evidence that I.S.’s writings in this field preceded by several years Ibn al-Haytham’s major work on Optics. An interesting paper - but one may wonder whether I.S. and Ibn al-Haytham did not make use of a common third source?


E. Astronomy and Astrology


(3) SALIBA, G., Ibn Sinâ and Abû ’Ubâyda al-Juzjâni - the Problem of the Ptolemaic Equant, in: JHAS, 4, (80), 376-403 (Engl-Ar). A. offers in fact an edition and an English translation of a treatise of al-Juzjâni, a pupil of I.S. In the introduction A. observes that there is no proof that al-Juzjâni’s idea concerning the Ptolemaic Equant was already present in I.S.


A. considers I.S. to be an “illuminated Oriental thinker” (in the line of Corbin). I.S.’s wisdom transcends temporal limits - astrological intuition being a part of its basis. Hereafter, one finds a classical description of I.S.’s emanative system. Finally, A. offers a (partly) Italian translation of a R. fi ’l-hay’ah, Tr. on Astronomy, ascribed to I.S. (see Works, C-k 4).

One gets the impression of a rash publication - A. does not really settle the problem of the authenticity of the Tr. on Astronomy.


Based on secondary sources, A. presents I.S.’s astronomical theory as a further development of the Ptolemaic system.
F. Chemistry and Alchemy


The Latin middle ages attributed 4 treatises on alchemy to I.S. Two of them, De Anima in arte alchemiae and Declaration Lapis physici, are shown by A., agreeing with Ruska, to be apocrypha. As to the De conglutinatione et conglutinatione lapidum its authenticity cannot be doubted, since it forms a part of the Meteorologica of the Shifā. In this text I.S. is a declared opponent of alchemy - a fact which plainly confirms Ibn Khaldoon’s affirmation in this respect. As to the fourth treatise, the Epistola de re recto (Ar: R. al-Kisti), A. accepts Atechi’s arguments in favour of its authenticity. However, he stresses much more than the latter that I.S. does not mention any substantial change in it, but refers only to different possibilities of celebration. Moreover, A. observes that this tract probably belongs to I.S.’s earlier works.

A. also offers for the last two-mentioned treatises the Arabic and the medieval Latin text, as well as a French translation (see Works, A II and C:1).

A very fundamental study, and, no doubt, extremely useful for further investigation on I.S.’s (al-)chemical ideas.

(2) ASLAN, M., see : ÖZER.

(3) DIRİÖZ, M., see : ÖZER.


(5) KAHYA, E., Avicenna and his Thought about Chemistry, in : Ulusl. I.S. Semp., 173-177 (Tu); 178 (Engl S.).

Acc. to S., A. offers a general survey of the history of chemical ideas from pre-history to the Latin middle ages - pointing to I.S.’s acceptance of chemistry, and also to his rejection of some misconceptions of alchemy.

A. adheres to Atech’s arguments in favour of the authentic Avicennian character of the R. al-Kitab, adding supplementary support from some Turkish biographers (most of them from the 16th and the 17th C.). In accordance with these biographers, he considers I.S. to be an important alchemist.
A. is no doubt confident in his late Turkish sources, but could have benefited from the consultation of Anawati’s study (see supra. 1), which he seems to be unaware of.

G. Geology and Geography

Summary of an allocation. Acc. to A., I.S. drew on contemporaneous chemical theories in order to explain geological processes.

(2) HAMOUDI, S., The Science of Earthquakes according to Ibn Sinā, in: Ris. al-Khaleej al-‘arabi, 3,10 (83), 57-77 (Ar).
After a very general introduction, A. reviews the conception of earthquakes in Greek and pre-Avicennian Arabic thought. Then he offers a detailed account of I.S.’s doctrine in this field. Among I.S.’s most prominent ideas, he points to the acceptance of the existence of different causes beneath the earthsurface - no earthquake being possible without the presence of all of them, and his distinction between three kinds of tremblings. According to A., one had to wait until the past century in order to see any substantial improvement of I.S.’s theory.
A very detailed survey of I.S.’s theory of earthquakes, but one may wonder whether A. does not exaggerate in modernizing I.S.’s opinions?

A. deals in conventional terms with some well-known geographical, or related topics. A. pays attention to such items as mountains, fossils, soils, hydrology and climatology.
Of limited value. A. interprets I.S. in a much too modern way.
H. Applied Sciences


A. recognizes that I.S. took many of his ideas on water from Hippocrates. However, I.S. himself did also develop new insights, at e.g. the purity of rainwater, the distinction of different kinds of water, etc. Then A. brings to the fore some specific techniques of water-purification, which one finds described in I.S.’s works.

At first sight A.’s analysis seems well founded, but a real verification of his interpretation is very difficult, since the many references to Avicennian texts, present in his exposé, are imprecise.


Chapter XVI

Medicine

A. GENERAL

B. DEONTOLOGY AND BEDSIDE MANNER
   I. Deontology
   II. Diagnostics

C. PSYCHOPHYSIOLOGY AND PSYCHIATRY
   I. Psychosomatics
   II. Psychiatry

D. HYGIENE

E. PEDIATRICS

F. GERIATRICS

G. ANATOMY

H. PHYSIOLOGY
A. General

(1) ABÛ RİDA, M., Avicennian Medicine: its Philosophy and its Method of Investigation (on basis of the Canon), in: Qudayât ‘arabiya, 9 (82), 107-120 (Ar).
A. affirms the Canon to be a perfect academic work as well as a useful manual, which is developed along logical lines. He presents such well-known items as I.S.'s definition of medicine (its peculiar, but limited area; its proper object; his views on disease, and its treatment; his theory of the soul and some of his medical experiments (in this latter respect, A. compares I.S. to John Stewart).
Good - can serve as a first outline of the relationship between medicine and philosophy in I.S.

(2) 'AMMAR, SL., Avicenne: “Le prince de la médecine”, in: Avicenne, 15-56 (Fr).
Introductory - clearly exaggerating I.S.'s contributions in the medical field.

(3) ID., Les écrits d'Avicenne; Ibn Sînâ: “Le maître par excellence”; L'apport d'Avicenne à la médecine; Avicenne, le psycho-somaticien; Maximes et citations d'Avicenne, in: Tunis méd., 58 (80), 543-555.
A slightly reworked version of 2.


(6) BEČKA, J., The Father of Medicine, Avicenna, in our Science and Culture: Abû ‘All Ibn Sînâ, in: Cas. Lék. čes, 119 (80), 17-23 (Czech).

See also:
II, 4, 12, 16, 18, 22, 26, 30, 31, 32, 33, 35, 36, 38, and Notes 2 and 5
V. A 23; V C 58
VII, 15, 16
VIII, 12, 32
XIV, A-I, I; XIV, A-IV, 9
XV, A 3, 6

(8) BRATESCU, G., Avicenna, le médecin, in: Proc. 16th Int. Congr. Hist. Sciences, 367-372. A. stresses that I.S.'s greatest achievements as a physician are of a theoretical kind. Moreover, Galen, not Hippocrates, constitutes I.S.'s main source - but one finds in I.S. also some real innovations. A. concludes that I.S. was the latest scholastic thinker who realized a "Summa" of the complete medical knowledge, but, at the same time, sometimes prefigures the modern experimental medicine. A valuable, well-balanced study.

(9) BRENTJES, S., Ibn Sinā als Mediziner, in: Ibn Sinā. Der fürstliche Meister, (V, A 5), 78-90. A. considers I.S. to be a physician who continued the tradition of Galen, but who introduced some modifications due to the influence of the Pneumatic school. A. also shows some originalities in I.S., but, at the same time, points out that he sometimes relapses with respect to Galen. A valuable paper.

(10) BUKHAROV, P., see KUZ'MIN, M.


(17) HASHEM, M., The Destination of Scientific Discovery in Ibn Sinā's Canon, in: RAJ Damascus, 62 (87), 445-462. In a somewhat general introduction, A. accuses the West of not having paid due attention to the real discoveries of the classic Arabic science and medicine. But, at the same time, A. warns that one should not confuse classical concepts with actual ones. In this respect, he stresses the totally different approach between I.S.'s medicine and modern medicine. From this point of view, A. criticizes Aroua (see infra, D 6), also expressing some techno-crítics (regarding materia medica, A. proposes a lot of corrections of Aroua's identifications). Interesting, and certainly a useful complement to Aroua.

(18) HAU, FR., Rhazes und Avicenna, in: Deutsches Ärzteblatt, 77 (80), 2644-2646 and 2689-2701; part II of this paper, entitled: Avicenna: ein "zweiter Galen", also in: Iranzamin, 1 (81), 39-44. A. offers no real comparison between al-Rāzī and I.S. A very general description of their medical system is given. Of almost no value.


A. examines Râzî’s and I.S.’s respective contributions to medicine in general. He carefully avoids any exaggeration or simplification by recognizing both’s dependence upon the Greek medical and/or philosophical tradition whenever evident, but he also takes into account their personal approaches (including similarities and differences between both of them). Proceeding this way, A. convincingly shows that both al-Râzî and I.S. formulated some new insights in some respects, which were quite relevant for the further development of medicine.
A most valuable paper although the references (in Arabic) are not explicit in the text itself.

For A., al-Râzî, who was the better and more progressive physician, was one of I.S.’s major sources. However, not all-Râzî’s writings, but I.S.’s Canon became the work of reference, both in the East and the West - thus keeping medicine in a static condition for many years. A. also offers a basic outline of the Canon, and an important bibliography (dealing with original works and secondary literature).
Very valuable, especially on the bibliographical level.

(25) KADYROY, A., see: SAIPOV, U.

(26) KATAYE, S., Le Canon d’Aviceanne, in: Adiyat Halab, 1 (75), 109-125 (Ar); 10-11 (Fr S); also partly in: Avicenne, 33-38 (Ar).
A. first presents (in a rather conventional way) a survey of those physicians, both in the East and the West, who underwent the influence of I.S.’s Canon, as well as of the editions and translations of the Canon, both in ancient and more recent times. A. also deals with the well-known facts of I.S.’s life and works. Finally, A. offers a broad outline of the Canon. In his final conclusion, A. stresses the scientifical-logical spirit of I.S.’s medical investigations, and ascribes to I.S. an all-encompassing knowledge of all medicine previous to him (not only Graeco-Roman, but also Syrian and Indian).
A good introductory paper.

The paper is one great eulogy of I.S.’s Canon, and of his so-called authoritative medical innovations!
Of no great value.

Glories as much as 27 I.S.’s “innovations”, A. even designating I.S. as the Arabian Galen!
Of no great value.

(29) KÖKER, A., Explanations in Relation to the Canon, in: Kayseri-Kongr., 57-69 (Tu).


(31) KUZ’MIN, M. and BUKHAROV, P., Ibn Sina and Folk Medicine, in: Fel’dshcher Akush., 46 (81), 50-52 (Ru).

The title is highly misleading. In fact, A. insists that I.S. (Maimonides following him in this respect) borrowed much more from Aristotle than from Galen. Nevertheless, I.S. adhered to some of Galen’s ideas, especially his teleological tendency. This is illustrated by A. by means of I.S.’s expose on the spine in the Canon (A. making use here of the 1491-?” Hebrew translation). A. concludes that this teleological approach (notwithstanding its being contrary to sound scientific investigation!) served as an incentive for future physiological inquiry.
An interesting paper, but somehow (too?) succinct.

A. presents a wide variety of medical ‘novelties’ in I.S. - even claiming that in some way I.S. is more progressive than present-day medical science! Moreover, he does not hesitate to state that I.S. appears in many of his works as a consistent meditator of materialist ideas (sic).
An over-glorification of I.S.’s medical innovations, presented inside an outspoken materialistic frame of interpretation.
Acc. to A., I.S. based the pathogenesis of diseases on humoral theory - in agreement with Greek thought. A. describes I.S.'s diagnostic skill, as well as his performances in the domain of psychotherapy as almost unequalled in the history of medicine.
The prudent approach of the beginning of this paper is unfortunately all too quickly forsaken!

(35) MÜSA, J., Ibn Sina and his Book: "The Canon", in: Pensée arabe... 482-502 (Ar).
A. offers a classical survey of I.S.'s major medical ideas regarding such items as the relationship between philosophy and medicine; symptoms and treatment of diseases; diagnostics, and preventive medicine (based on the Canon).
Valuable, although introductory.

Acc. to A., the contest between Galen and Aristotle was nowhere as dramatic as in I.S.'s works. Although I.S. was committed to the Aristotelian point of view, he accepted the new (post-Aristotle!) Galenic evidence in anatomy and physiology, and tried to interpret it so as to fit the Aristotelian theory. As to the Canon, A. stresses that it is unique as a magisterial exposition of Galenic medicine in the Arabo-Islamic world of the 9th-11th C. But, in contradiction to his famous predecessor al-Ma'ārif, I.S. explicitly wished to delineate the proper area of medicine, and specify how it differs from natural philosophy. With respect to I.S.'s biological views, A. concentrates on the K. al-Hayawānī, Book of Animals of the Shi'a, Cure. In this work, he distinguishes three different kinds of texts:
1. Summaries of Aristotle's Historia Animalium and De Generazione Animalium (according to Ibn al-Bīrūnī's Arabic translation);
2. Elements of a new synthesis by the introduction of Galenic materials - but saving Aristotle's theory in the end (A. mentions in this respect I.S.'s theories of the heart and of sexual generation);
3. Substitutions - almost the entire part paralleling Aristotle's De Partibus Animalium is directly derived from the Canon (A. offers a table of concordance between the K. al-Hayawānī and the Canon).
A. remarks that the space devoted to anatomy in the Canon is more than double than that found in Aristotle, and that there is a clear tendency to narrow the focus of biology from the living creature as a whole to man. He concludes that I.S. probably never finished the K. al-Hayawānī himself having only written the basic outline of the main topics (B. 11 contains such an original outline by I.S.).
A significant paper, especially with respect to I.S.'s Book of Animals, and the basic background of I.S.'s conception of medicine.

After a brief description of the development of Arabic medicine before I.S., and of I.S.'s life, A. concentrates on the Canon. A. offers a succinct survey of its different parts also paying attention to its method (the general preceding the particular - philosophically based option), its classification (modern, but with some mistakes) and its sources (not always easy to detect). Hereafter, A. presents some major topics of I.S.'s medical teachings, such as e.g. diseases, their symptoms and their treatment, surgery, ophthalmology, and psychotherapy. A. concludes that for I.S. the medical art was only a part of the all-encompassing domain of philosophy. In a kind of appendix, A. surveys the high-points of the Latin translations of I.S.'s medical works.
A good introductory paper - indicating very well the exact place I.S. reserved for medicine, but questionable on some particular points (e.g. A.'s contention that I.S. recognized the existence of an intermediary state between health and disease, and even divided it further into three subdivisions).

Out of I.S.'s remark (in his Ta'anit, Notes) that it is humanly impossible to stand upon the reality of things, A. concludes that there is a rational scepticism in I.S.'s theory of knowledge, and asks how it may be reconciled with I.S.'s association with, and practice of medicine? For I.S., medicine was not a "real" science, and the distinction between theoretical and practical medicine is a distinction on the whole between descriptive statements of principles and prescriptive statements of practice. Consequently, empirical discoveries can only be made meaningful against the background of an already given theoretical model. So, the aim of medicine appears as the formulation of a set of beliefs. Moreover, I.S. defines the relationship between a particular and a universal in terms of a catalytic function, and as being merely one of conjunction. A. concludes that I.S. was an anti-indivist, although not an epistemic positivist or anti-empiricist.
An interesting and original paper, but one may wonder whether I.S. was really a "rational sceptic"? Compare also, Logic, B 7.

A. formulates some kind of program for further research on I.S. as a physician and as a scientist. He hereby defends an outspoken Marxist approach, and sharply criticizes Western scholars (in a very general, and totally unfounded way).
Of no importance.


A. presents I.S. as a kind of superhuman Being, and the Canon as an almost sacred book. He discovers great originality in I.S.’s medical ideas, general as well as specialized (in almost all fields).
A. clearly overemphasizes the merits of I.S., and his innovations.

A. offers a brief summary of the Canon, but points also to I.S.’s introduction of Aristotelian principles (the doctrines of the four causes and of the four elements) into his medical theory; A few major items and innovative ideas of I.S.’s medical writings are also mentioned.
A valuable first introduction.


An amalgam of I.S.’s medical ideas is presented by A. - with some special attention to healthcare and therapeutics.
Of almost no significance.

(47) SÁLIM, F., Ibn Siná, the Physician, in: Al-dhikr..., 59-77 (Ar).
In the introduction of this paper, A. insists that for I.S., medicine is subordinated to philosophy, and he hereby points to the doctrines of the unity of body and soul (citing Thomas Aquinas), and of man as microcosm (referring to I.S.’s R. fl F-isha, Tr. On Love). For A., it is certain that I.S.’s medicine is the result of a synthesis between Greek thought and Islamic wisdom. So, not only philosophy, old and contemporary medicine, and experimentation, but also shari’a (Islamic Law) can be found among its roots. The basic principles of I.S.’s medicine are presented in a rather conventional way, while I.S.’s innovations are briefly dealt with (acc. to A., they consist in the introduction of causality; prevention; transfer of diseases; experimentation; psychosomatics and pharmacology). To conclude, A. situates I.S. in the history of medicine.
Introductory - but it is certain that A. overestimates the “Islamic impact” on I.S.’s medicine.

A. presents I.S. as a "modern" human being, because he occupied himself with such different domains as philosophical wisdom, scientific experimentation and political responsibility. Acc. to A., medicine functions in I.S. as a model-science: it illustrates by its very nature the interdependence of the different sciences (the systematization of the sciences being based on the division into theoretical and practical). After these introductory remarks, A. specifically concentrates on I.S.’s Canon, which he still considers to be a real "Summa Medicinae". Among A.'s many observations we may note:
His insistence on the presence of both theory and praxis in the Canon;
His contention that I.S.'s physiological opinions, which were mainly based on Galen, put an end to ancient medicine, and offered a guarantee for all future medicine;
The explanation by I.S. of all pathologies based on his doctrine of the four temperaments;
The necessity of both ratio and experimentum in order to clarify the therapeutic value of drugs;
I.S.'s doctrine of the 'regimen sanitatis'.
A. also offers a well-documented bibliography.
A valuable study, but one may wonder whether A. does not fall victim to his undoubtedly great admiration for I.S.?  

Very general, based on doubtful sources.
Of no value.


(51) SLAMA (BEN), H., Ibn Siná et sa contribution à la médecine, in: Avicenne, 29-32 (Ar).
Miscellaneous ideas.
Of no great value.
A survey of the general outline of the Canon, selecting a few relevant examples in order to show what kind of medicine I.S. adhered to. Honest, but introductory.

Almost the same as 52, but paying some special attention to I.S.'s ideas on the preservation of health.

(54) VIEISA TREVIÑO, C., La medicina de Avicena, in: Med. Trad. (Mexico), 45-51 (N.C.).


A. discusses three major tendencies one may find in the interpretation of I.S.'s medicine during the last two centuries. The first tendency had a general negative prejudgment against the Islamic culture. Some authors (Spengel among them) criticized I.S. for his major contribution to the stagnation of the development of medicine. Another tendency, shown by Neuburger, had its origin in historian, and described I.S. as a genius who systematized in a most logical way the total Gracco-Arabic corpus of medical knowledge - although I.S. is presented at the same time as being above all a theoretician, who possess almost no practical experience. The trend to glorify I.S. even became stronger in the last decades - some authors presenting I.S. a real innovator on the theoretical as well as on the practical plane. A. judiciously remarks that particular attention has to be paid to the specific terminology (and that the Latin translation by Gerard of Cremona may be useful in this respect), to historical circumstances and to the possibility of new discoveries by pure theoretical means. A. hereafter enumerates a lot of innovations which were wrongly ascribed to I.S., and observes that it is sometimes very difficult to 'remove' them - even from scientific publications! A. concludes that I.S.'s contribution to the development of medicine was mainly of a theoretical kind - I.S. practicing medicine in a rather sporadic way, as becomes evident in his autobiography, and his considering medicine not to be a science of primary importance.
A. very fine, and most fundamental paper.

After a most conventional account of I.S.'s life, A. briefly presents the main ideas of Canon, book I (A. hereby stresses that I.S.'s theoretical framework, however strange it may seem, now, "worked" in his time). With Shah and Gruner A. evokes also the possibility of Chinese and Indian sources for I.S.'s medical ideas. Of no great importance.

(58) ZAMÂN HUSAYNĪ ŞĀḤĪB, M., Shaykh Abû `Ali Ibn Sinâ, the Genius of the Canon of Medicine, in: Indo-Iranica, 34 (81), 1-43 (Pers.).
After a general introduction, A. examines I.S.'s fundamental purposes for writing his Canon, paying attention to some later Arabic sources, which discussed I.S.'s work. Further, A. expounds several, according to him innovative remedies, as well as some rare diseases present in the Canon. Finally, A. discusses the influence of the Canon, and offers extensive lists of I.S.'s own medical writings, as well as of compendia of, and commentaries on his Canon. Good, but introductory, and not always critical with respect to I.S.'s real originality.
B. Deontology and Bedside Manner

I. DEONTOLOGY

(1) AŞÇIOĞLU, O., Ibn Sinā and Deontology, in: Kayseri-Kongr., 79-93 (Tu).


II. DIAGNOSTICS


(2) YÜSECOY, M., Patient's Examination according to Avicenna, in: Kayseri-Kongr., 143-148 (Tu).

C. Psychophysiology and Psychiatry

I. PSYCHOSOMATIC

(1) 'AMMAR, S., Avicenne (980-1037). Rôle et importance du psychisme et du système nerveux dans la médecine d'Avicenne, in: Médecine et Hygiène, 958 (71), 581-584 and 959 (71), 616-618.

A presents I.S. as a super-genius, who was the second (sic!) master after Aristotle. I.S.'s psychosomatic "skill" is considered by A. as evident (because of the well-known stories in Nizârî - although A. does accept that there were Greek precedents for these stories). A. discovers in I.S. a pre-cursor of actual morphopsychotherapy, and also of many actual hygienic opinions. Moreover, he suggests that I.S.'s musical theory is primarily elaborated as a therapy for mental diseases.

For him, I.S. defended without any doubt a psychosomaticl approach of medicine.

Esp. in the light of 2, A.'s basic thesis seems very questionable.


After having presented some evidence of the great esteem in which the Latin Renaissance held I.S. as a physician, A. devotes the main part of his paper to the famous story of Antiochus and Stratonikê (and the implied idea of a psychosomatic disease), and remarks that whereas the West ascribed the role of 'clever Wise man' to Erasistratus, Hippocrates or Galen, the East bestowed it on I.S.

Well-documented - most significant regarding I.S.'s so-called discovery of psychosomatiques, or psychotherapeutics.


Acc. to A., I.S. was well aware of psychosomatiques, and even of the pure psychic basis of various diseases. Moreover, I.S. held some observations on psychotherapeutics. Several times A. links also ideas, ascribed by him to I.S., with contemporary views. His main sources are the Canon, and, more importantly, the Chahar Maqūla of Nizârî.

A. clearly overestimates I.S.'s personal contribution to the very idea of psychosomatiques, as well as to the development of psychotherapy.
II. PSYCHIATRY

(1) BAYRAM, M., Avicenna and Psychiatry, in: Kayseri-Kongr., 97-100 (Tu).


Acc. to S., A. stresses the central place that the concept of psyché occupies in I.S.'s system, paying attention to I.S.'s theory of pathogenesis in mental disorders, as well as to his psychodiagnostic method.

D. Hygiene

As far as can be determined, the first encompassing study on I.S.'s hygienic views. A. first mentions the physiological and epidemiological basis of I.S.'s theory. Then, A. discusses the hygiène of the "interior environment", as well as of the "exterior environment". Further, A. deals with infectious diseases and wounds, and their treatment. Finally, A. concentrates on the special hygiène of eyes, ears and teeth. In all these matters, A. offers long citations from the Canon (but A. omits to give the exact references), along with limited interpretations, which reflect actual insights.

(2) ID., Ibn Sinâ et la prévention médicale, in: Avicenne, 57-61 (Fr).
A brief summary of 1.

(3) ID., L'hygiène et la prévention chez Ibn Sinâ, in: Tunis méd., 58 (80), 556-559.
A slightly reworked version of 1, ch. 2-3.

Similar ideas as those found in 2 and 3.

Summary for a larger public of 1.

An improved version of 1 - the general structure has been ameliorated, the citations are specified, and some parts (e.g. on parasites) are presented in more detail. But A.'s basic perspective remains unchanged. For a critical supplement to this study, see supra, A., 17.
(7) ATABAEO, SH., BABABHODZAEV, N. and IL'INSKII, I., Hygienic Views of Ibn Sīnā (in the Millenary of his Birth), in: *Gig. i san.*, 1979, 36-40 (Ru).


Inc. to A., I.S., in his *al-Hayawan. B. of Animals*, integrates the post-Aristotelean biological observations (e.g., the discovery of the ovaries) into the Aristotelian system. However, one finds another, more eclectic treatment of generation in the *Canon*. For A., this fact well illustrates that for I.S., medicine is an independent art, having different requirements than those of natural philosophy. Regarding I.S.'s theory of contraception in the *Canon*, A. points out I.S.'s dependence on al-Rāzī. He also pays attention to the way in which the European churchmen masked birth control information, although the Latin version of the *Canon* shows no sign of censorship.

A significant contribution.


A. first points to the fact that the Islamic world had a different approach to sexuality than the Christian world. In I.S.'s conception (which has to be gathered from different parts of his works), sexuality finds its philosophical-ethical foundation in the classical theory of the harmony between the upper and the lower parts of the soul. In practical sexual education, I.S. incorporated the prevalent social views - the predominance of man, and procreation being the principal source of sexual intercourse. A. concludes that I.S. viewed sexuality rather positively, although he (on ethival grounds) rejected pleasure in itself as a proper motive for the sexual act. It may be noted that A. observes that I.S.'s description of the function of the clitoris sounds very modern, but, at the same time, indicates that it is a logical consequence of I.S.'s theory of the female *samen* (based on Galen and Almousen of Croton).

An exemplary case-study!

(12) ÖZÜGÜL, Y., Sport during the Lifetime and Termal Spring (sic!) according to Avicenna, in: *Kaysia-Kongr.*, 170-172 (Tu).

(13) PAYZIN, S., The Summaries related to the Effect of Climate and Environment to (on?) Health and Diseases in the *Canon* of Avicenna, in: *Kaysia-Kongr.*, 161-169 (Tu).

(14) PETROV, B., Problems of Public Health in the *Canon* of Ibn Sīnā, in: *Gig. i san.*, 1980, 22-25 (Ru).


A general overview of I.S.’s observations in the *Canon* about food and dietetics - no analysis being offered (A. just states them as the result of observation and experience). Of no great significance.


E. Pediatrics

(1) DILMEN, U., Avicenna and Diseases of Children, in: *Ulasl. I.S. Semp.*, 569-573 (Tu); 573 (Engl S.).
Acc. to S., a short enumeration of all diseases in children known to I.S.

(2) HASANOĞLU, A., Avicenna in Pediatric Medicine, in: *Kayseri-Kongr.*, 75-78 (Tu).


(6) YURDARÖK, M., Avicenna and Baby Care, in: *Ulasl. I.S. Semp.*, 425-432 (Tu), 432 (Engl S.).
Acc. to S., A. concentrates on I.S.'s remarks about breast-feeding, as well as on other aspects of baby care.

F. Geriatrics

French abstract (it has not been determined whether the original was ever published) indicates the existence of different gerontological aspects in I.S.'s medical work.

(2) HOWELL, TR., Avicenna and His Regimen of Old Age, in: *Age and Ageing*, 16 (87), 58-59.

(3) ID., Avicenna and the Care of the Aged, in: *The Gerontologist*, 12 (72), 424-426.
2-3: enumeration of the most important passages in the Canon concerning gerontology, particular attention is paid by A. to thesis 3 of B. I in his 3. Both papers together offer a serious basic outline for I.S.'s gerontological views.

G. Anatomy

A. presents I.S. as the anatomist par excellence of his times. Acc. to A., I.S. not only systematized the totality of the anatomical knowledge of his Greek and Arabic predecessors, but also formulated some new insights, and, above all, asserted that anatomy was the very basis of medicine.
Of no great value - such a highly positive judgment being not justifiable, see 3.


Acc. to G. Rath (in his Ph. D. Thesis, Bonn, 1948), I.S. already distinguished cortex and medulla cerebri in his Canon, III, 1.1.2 (acc. to Latin translation of Gerard of Cremona). A. reexamines this passage. He first points out that in I.S. (as in all ancient and medieval authors) encephalon, Ar. *dīmāgh*, Lat. *Cerebrum*, has a rather broad sense - its denotation being larger than the strict substance of the brain. Moreover, A. takes into account the Arabic original (giving some imprecisions of Gerard’s translation), and pays special attention to Galen’s theory of the brain. A. convincingly shows that I.S. clearly follows Galen, at least as far as the neurophysiological point of view is concerned. For the structure of the bodily tissues, I.S. adopted Aristotle’s point of view. A. concludes that the above distinction remained unknown till Vesalius.
A study of utmost value.

(4) ORTUG, G., Über die Arbeit von Ibn Sina für die Blütefasse, von denen man Blut entnommen werden kann (sicl), in: *Uesl. I.S. Semp.*, 257-272 (Tu); 272 (Germ S.).
Acc. to S., a study on the veins that I.S. believed to be candidates appropriate for venesection (based on I.S.’s treatise *Al-foṣal, On Venesection*), and a comparison with contemporary opinion.
H. Physiology

A. considers I.S.'s description of respiration physiology as an historical landmark in the approach to respiratory mechanics. Outlining this description in view of actual respiratory theory, A. stresses that I.S. prefigures on several occasions the medical revolution of the Renaissance (e.g. in his analysis of the nature and the role of the respiratory exchanges). However, A. also recognizes that I.S. sometimes makes the same mistakes as his predecessors, especially Galen (e.g. in the description of the blood circulation). Valuable, although there is a clear tendency by A. to use modern terms in his interpretation of I.S.

(2) HUSSAIN, S., Body Fluids according to Avicenna, in: *Bull. Ind. Inst. Hist. Med.*, 13 (83), 52-58; also in (differently entitled: Fluid Dynamics, according to the Canon): *Hamadard Med.*, 261 (83), 76-83.
A. presents I.S.'s theory of bodily fluids as highly innovative, and, even from the present point of view, very unique. He points *inter alia* to I.S.'s distinction between primary and secondary fluids (indicating that I.S. probably knew about the distribution and exchange of electrolytes between the various body fluids), his connecting bodily fluids with genital continuity (I.S. prefiguring Weismann) and his postulating a very ingenious concept of fluid dynamics which can be termed as "Calorie-Fluid Relationship" (and being the basis for growth and senescence). It has to be noted that A. always cites I.S.'s original Arabic terminology, and offers two tables - concerning the classification of body fluids, and concerning fluids and germinal continuity. A.'s explicit attention to I.S.'s own terminology is most gratifying, but his identification of it with present terminology is highly questionable since there exists no real basis for any kind of valuable comparison in the physiological field.

A further development of a particular point of 2 - the basic approach remaining exactly the same. Authors state that I.S.'s definition of growth has not been improved by modern science, and that nothing in his physiological theory of growth and ageing can be contradicted by the modern advocates of the positive and negative nitrogen balance. For critical evaluation, see 2.


A. summarizes in a clarifying way I.S.'s theory of humours, according to *Canon*, book I (A. uses the critical 1982-ed. - see Works, B1). A. is conscious of the fact that I.S. dealt elsewhere with this subject, and that the rest of the *Canon* has to be investigated in order to know how I.S. applied his theory in practice. Nevertheless, this primary outline permits him to formulate some pertinent conclusions:
1. The physiological system presented by I.S. was a highly speculative system (but A. recognizes that another solution was impossible at that time);
2. I.S. does not seem to have been aware of the difference between a fact and a hypothesis;
3. I.S. seems to have limited himself to the presentation of an extremely short, concise epitome of Galen's relevant works. Introductory, but most enlightening - although one may wonder whether A.'s third conclusion, as far as it describes I.S. to be an epistemizer of Galen, is not formulated somewhat over hastily?

A. first outlines the basic anatomical and physiological knowledge, which the Greeks had elaborated, and which was commonly accepted in I.S.'s times. He most lucidly uses this knowledge as an appropriate background for the presentation and analysis of I.S.'s theories on digestion and on the formation of humours (significant in this respect is his observation that "in the absence of the knowledge of digestive juices, it had to be assumed that the food was digested by the heat of the body"). He does not hesitate to state that I.S.'s description of the formation of urine is unclear (I.S. probably ignoring Galen's explanation). A valuable paper - but A. unfortunately does not indicate his text-source (probably *Canon*, b. I), and his treatment of the subject is certainly not exhaustive.

Based on *Canon*, Book 1 (acc. to Gruner's translation), A. surveys and analyzes in great detail all observations of I.S. about the pulse - its definition (acc. to A.), still valid, at least when one takes into account I.S.'s ignorance of gaseous
I. General Diseases

1. CONTAGIOUS DISEASES


(2) CARRERAS PANCHÓN, A., Sobre el concepto de Pestilencia (Wâdâ) en el Canon de Avicenna, in: Asclepio, 33 (81), 265-273. Out of a detailed analysis of Canon, 4.1.4. - the fragment on wâdâ’ (A. using both the Venetius 1582-ed. and an unpublished translation from the Arabic original by F. DIAB), A. makes it obvious that I.S.'s theory of pestilence was based on Greek medicine, especially Galen - this being valid both for the general description and the specific clinical observations). Moreover, wâdâ’ is used by I.S. in the same broad sense as was characteristic for the Galenic loimos. Only as far as the premonitory signs are concerned, one may find personal observations by I.S., but those being of a rather speculative kind! A. however judiciously remarks that there existed no possibility whatsoever for I.S. to have a direct, or even close experience of an epidemic of pestilence. A. concludes that I.S. offered a somewhat better systematization of the Hippocratic and Galenic writings (I.S. paying some (moderate) attention to the Qur’anic tradition), although he did not present any new insights.

A very valuable case-study.

(3) GUERRA, FR., The Description of Syphilis in Avicenna, in: 27. Congr. Int. Hist. Med., II, 731-733. A. points out that in classical Arabic works on medicine, one finds the term of sahaflât. I.S.'s explanation in the Canon permits us to identify it with syphilis (also al-Râzi mentions it, but I.S.'s description appears superior). An interesting study - discussing a disease unknown to the Greeks, and most probably discovered by the Arabs (although one cannot exclude a priori the possibility of an Indian (or even another ancient) source).

some manuscripts. A stresses that I.S.'s description of rabid animals reveals the qualities of the perfect observer - these qualities being confirmed by I.S.'s detailed account of the prognosis and the progress of the illness in man (with its particular attention to the symptom of hydrophobia). I.S.'s prescriptions concerning the treatment of the wound (the application of various ointments, blisters and drugs, but, above all, the cauterization of the wound) are considered by A, as clear progress in the history of medicine. The great importance of I.S.'s contribution to this field becomes evident in some later Ottoman medical writings (14th-18th centuries). A well-documented paper.

A. summarizes I.S. account of tuberculosis (predisposing factors, symptoms, clinical manifestations, treatment) based on the Canon. He affirms that I.S.'s classification of tuberculosis into three stages is the same as that of modern medicine.
At most, introductory.

A. presents a rather detailed description of I.S. theory on rabies in the Canon (A. hereby uses a French translation by H. CAMUSSI of this part of the Canon, which was published as a separate tract in Journal Asiai, 1888). A. affirms that this description is highly precise and detailed, but points at the same time to the absence in I.S. of an attempt to specify the etiology and the localization of the disease (as Caelius Aurelianus had done before him). Nevertheless, I.S. excelled in some respects, i.e. his insistence on the presence of urinary troubles in a rabid man, and his therapeutic advice (most especially his description of preparations based on Lytta vesicatoria L.). A valuable paper.

See also: R. 2.

II. CANCEROLOGY

(1) ERDOGAN, YU., Blood Diseases, Cancers and Infections, in: Kayseri-Kongr., 135-142 (Tu).


A. concentrates on the causes, the diagnostics, the prevention, and treatment of cancer - dealing sometimes extensively with contemporary views, the relevance of which is not always clear with respect to I.S. Moreover, there appears to be some tendency in A. to overvalue the significance of I.S.'s contribution (as well as that of classical 'Tranant' (usually referred to as Arabic) medicine. From an historical point of view, of no great value.

III. DIABETES

After a brief survey of the history, the nomenclature and the present knowledge of diabetes, A. outlines I.S.'s physiological, pathological and therapeutic ideas (in a rather vague way - no single text-reference being present!). At most, introductory.

IV. MICROBIOLOGY

(1) FAZLI, A., Pathogenic Microorganisms, Humoral Pathology and Immunology, in Avicenna's Medicine, in: Kayseri-Kongr., 109-120 (Tu).


(3) TARARIN, R., Importance of the Scientific and Historical Heritage of Ibn Sinâ in the Field of Epidemiology and Infectious Pathology, in: Zh. Mikrobiol., 1974, 112-118 (Ru).

V. PARASITOLOGY

J. Ophtalmology

(1) HAMĂRNEH (AL-), N., Medicine of the Eye in the Canon, in: *Al-ṭurāth al-ʿarabī*, 2, (81), 100-113; also in: *Al-shaykh al-rāʾis*, 197-214 (Ar).

After some general remarks on I.S. as philosopher and as physician (and on his Canon and Poem on Medicine), A. concentrates on the classical Arabic works on ophtalmology, and formulates some fundamental questions about I.S.’s possible sources in the field of ophtalmology (with special attention to al-Rāzī), as well as on the exact influence the Canon had on later generations. However, A. does not formulate any answer, not even in a tentative way. In the final part of the paper, A. presents some observations about the K. al-sīlahān, *On Visual Perception* (a work belonging to the dūḥāia).

A. poses some valuable questions - but one looks in vain for possible answers.


General work on the anatomy of the eye, as well as of the humours present in the eye (according to the Canon). Authors ascribe great originality to I.S. Introductory - but uncritical in the evaluation of I.S.’s originality.

(3) KAHYĀ, E., Eye and Eye’s Diseases in Avicenna’s Medicine, in: *Kayseri-Kongr.*, 121-130 (Tu).

K. Stomatology


Based on the Canon, A.’s presentation of I.S.’s theories about anomalies of the tongue and the formation of the voice is brief, but interesting. Acc. to A., the theory of the tongue is exclusively based on Galen, while the theory of the voice is clearly different from Galen (and even differs from I.S.’s own view, as given in his phonetical works).

An interesting case-study.

(3) Uzel, I., Comparaison du Canon avec le Mudžez au point de vue orlonto-stomatologique, in: *Usl. I. Semp.*, 447-452 (Tu); 454 (Fr S.).

In the S., A. affirms that the Mudžez has fewer details than the Canon on the specific topic of stomatology.
L. Diseases of Specific Organs

I. OTORINOLARYNGOLOGY


(2) KATAYE, S., La paralysie faciale selon Avicenne, in: Ann. Oto-laryng., 92(2), 75-82.

A summarizes I.S.'s view on facial paralysis according to Canon. III, F. 2. A claims that I.S. is the first physician who distinguished between peripheral facial paralysis and central facial paralysis. A also deals with I.S.'s ideas regarding therapeutic as well as surgical treatment.

Good, but does A. not overemphasize I.S.'s originality?


Acc. to A., I.S.'s descriptions in the Canon of ENT-diseases are still valid, but his remarks about the etiology and the treatment of these diseases belong to the tenets and concepts of his time. A also stresses that I.S. attached much importance to the preservation of health.

Introductory. One looks in vain for precise references!


A. gives a significant primary outline of I.S.'s opinions concerning diseases of the nose and the throat (using contemporary translations of the Avicennian texts mentioned in the title but also several secondary sources). He finds in I.S. a major concern with infections, although there is little attention paid by him to traumatology. A also notes that I.S.'s treatment of angina was more complete than that of the Greeks, and that the chapter in the Canon on respiration is quite elaborate. At the end of his paper, A. also deals with I.S.'s description of meningitis, which he considers innovative and very precise.

Good, but not really innovative.

II. NEPHROLOGY


A states that I.S.'s description of renal calculi in the Canon is much more detailed than those in other ancient medical works. In considering the different aspects of I.S.'s theory, A. notices that some of I.S.'s views are still valid today (e.g. his analysis of the causes of the formation of renal calculi, as well as some of the drugs he mentioned as specific for the treatment of renal calculi). Acc. to A., the surgical instrument which I.S. used to crumble and eject renal calculi was most probably the lithotome. A. valuable paper - but in need of some further work developing precise information regarding I.S.'s (direct and indirect) historical sources.

(2) ID., Renal Diseases and Their Treatment in Ibn Sinā, in: Ibn Sinā. Doğumunun..., 275-291 (Tu); 293-307 (Eng).

Includes 1. but adds an analysis of the description by I.S. of five other renal diseases: poiosis, renal weakness, renal swellings, renal trauma, and ulcers in the kidney and urinary passages. The basic approach is almost the same as in 1. A. sometimes (but not systematically) indicates a historical source, and insists on some occasions that a particular principle of I.S. is still correct according to contemporary medicine (but, on the whole, the tendency to ascribe 'modern' views to I.S. predominates).

A. good study - but one may wonder if A. does not overemphasize somewhat I.S.'s originality?


(4) KARACAGIL, M., Avicenna as an Urologist, in: Kayseri-Kongr., 94-96 (Tu).


Out of the Canon, the different aspects of I.S.'s theory of the kidney (anatomy, function, diseases...) are briefly discussed. A. indicates some remarkable observations by I.S., but mentions also some evident errors, or some diffused...
III. CARDIOLOGY


A most general survey of a few major items of I.S.’s observations in the Canon on the anatomy and the pathology of the heart. A. considers I.S. to be a great innovator - the latter’s understanding of the circulation of the blood would be almost equal with that of W. Harvey (sic!).

Of no value.

(2) FAROOQUI, A., Cardiovascular Diseases as described by Ibn Sinā in his Qānūn fī ‘l-Tibb, in: H. HAMEED (Ed.), Avicenna’s Tract..., 130-165.

A most detailed analysis of the different passages of the Canon concerning cardiovascular diseases.

A well-documented study.


A’s analysis concerns Canon, III, 9. A. sees the heart simultaneously the anatomical and physiological aspects of I.S.’s writing on the heart. In this respect, A. observes the absence of any significant difference with the views of I.S.’s predecessors. Then A. summarizes the different elements symptoms, causes, effects and treatment - of I.S.’s doctrine concerning heart diseases. Finally, A. judiciously remarks that this section of the Canon is very similar to the same section of al-Majāli’s Kāmil as-sinā’at al-‘ibbīyya: Perfection of the Medical Practice, but that there exists sufficient evidence that I.S. also used his personal knowledge and experience when writing it. A. concludes that this section of the Canon is well organized, but is still imperfect.

A very valuable case study - compare also infra, P. 9.

IV. GASTROENTEROLOGY


(3) MANSUROV, KH., Avicenna o nekotoruih bol'nyxak organov pisije vareniya i priva'l'nom pitanii (Avicenna on Certain Diseases of Digestive Organs, and the Correct Diet). Dushanbe, Donish, 1979, 44 pp.


See also: R 7.
M. Skin Diseases and Cosmetics

Authors summarize I.S.’s description of diseases of hair and of skin, as well as their respective treatment (based on the Urdu-translation of the Canon). They make many comparisons with present practices in Indian medicine, and state I.S. to be the only medieval physician to have dealt in so great detail with this topic.
Of no great value - but an interesting testimony to the present dealing of Unani-medicine with I.S.’s medical works and ideas.


N. Surgery and Anaesthesia

I. SURGERY

(1) BILGE, A., Surgery of Avicenna and His Role in Today’s Surgical Notion, in: Kayseri-Kongr., 149-155 (Tu).

Acc. to Girs (See Varia, 15) includes an important bibliography.

Reprint of this paper, originally published in Archiv für klinische Chirurgie. 30 (1884), 745-752.

A. points to the fact that one may find a lot of information about anaesthetic methods in Arabic medical works of the 11th C. (notwithstanding the absence of any systematic treatise), as is shown by I.S.’s Canon. The Canon offers the description of forty plants having anaesthetic properties (five of them are presented in some detail by A. - although most in I.S.’s own terms, without any further comment). One also finds practical advice (also this time A. only offers a few concrete examples).
Good, but introductory - clearly in need of further development.


(6) SANAGUSTIN, F., La chirurgie dans le Canon de la Médecine (al-Qânûn fi 't-tibb) d’Avicenne, in: Arabica, 33 (86), 84-122.