

## Miscellany

### STITCHING WOUNDS WITH THE MANDIBLES OF ANTS AND BEETLES

#### A Minor Contribution to the History of Surgery

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One so fortunate as to have the opportunity to browse over natural history books and journals is likely, if on the lookout for such, to run across many unusual and very interesting things. So it has fortunately been with me, and from time to time accounts falling under the title of this paper have been collected, until now it seems well to bring this material together into a short article.

We are all aware that, in the past, formic acid was obtained by distilling the bodies of ants—indeed, this acid owes its name to the Latin word *formica*, an ant. Furthermore, it is on record that in central Africa the native inhabitants by pressure obtain from the bodies of certain ants an oil of excellent taste for use in cooking, while the crushed bodies of the ants are eaten as we eat liver sausage. Then, again, certain ants collect and store up honey, which is eaten, while the bodies of still others are eaten as food without the extraction of oil, acid or any other product. But that ants are used in surgery is probably a new thing to the majority of the readers of this journal.

#### USE OF ANTS IN SOUTH AMERICA FOR SUTURING WOUNDS

William Beebe<sup>1</sup> speaks of wearing boots as a protection when making an onslaught on the subterranean domiciles of Atta ants in British Guiana. He writes that a year later:

"When I unpacked these boots this year I found the heads and jaws of two *Attas* still firmly attached, relics of some forgotten foray of the preceding year. This mechanical vise-like grip, wholly independent of life or death, is utilized by the Guiana Indians. In the place of stitching up extensive wounds, a number of these giant *Atta* Maxims are collected, and their jaws applied to the edges of the skin, which are drawn together. The ants take hold, their bodies are snipped off, and the row of jaws remains until the wound is healed."

Truly a very neat way of stitching a wound, but not a new one even for South America. Emile Mocquerys<sup>2</sup> of Rouen, France, while traveling in Brazil, observed a similar use of ants and reported it to the Société entomologique de la France in 1844 as follows:

"The savages employ the same species [*Oecodoma cephalotes*, Latr., *Formica cephalotes*, Linn.] to hold together the edges of a wound. They cause this insect to bite the two edges of a wound [when brought together], then they snip off the thorax and abdomen and hence leave only the head, which now holds the edges of the wound tightly together. It is not rare to see natives of Brazil who have thus a wound well on the way to healing held by the heads of seven or eight of these ants."

#### USE OF ANTS IN MEDITERRANEAN LANDS

Strange to say, both Mocquerys and Beebe are confirmed in their statements by a similar account of an almost present-day like use of ants coming from a region as remote as Asia Minor, literally thousands of miles away. The first account is by R. M. Middleton,<sup>3</sup> who writes in 1896 as follows:

"I have lately had the opportunity of making the acquaintance of Mr. Miltiades D. Issigonis, a Greek gentleman from Smyrna, now residing in London. Mr. Issigonis fell from his

horse in Smyrna about six years ago, and received a severe but clean cut of an inch or rather more in length on the forehead above the right eye. In accordance with the custom of the country, he went to a Greek barber to have the wound dressed, and the barber employed at least ten living ants to bite the two sides together. Pressing together the margins of the cut with the fingers of the left hand, he applied the insect by means of a pair of forceps held in the right hand. The mandibles of the ant were widely open for self-defense, and as the insect was carefully brought near to the wound, it seized upon the raised surface, penetrated the skin on both sides, and remained tenaciously fixed while the operator severed the head from the thorax, so leaving the mandibles grasping the wound. The same operation was repeated until about ten ants' heads were fixed on the wound, and left in position for three days or thereabouts, when the cut was healed and the heads removed. The ant employed is described by Mr. Issigonis as being about three eighths of an inch long, very dark brown in color, and of a particularly fierce disposition. Mr. Issigonis has kindly endeavored to obtain the ants from Smyrna, and I hope that some may arrive ere long. We have together examined the specimens in the Natural History Museum, by the courtesy of Mr. W. F. Kirby, F.L.S., and Mr. Issigonis identified a rather large-headed *Camponotus* from India, not yet specifically named, as being nearer to the species in question than anything else in the National collection.

"Mr. Issigonis . . . tells me that the operation is a frequent one in the vicinity of Smyrna, and is, to the best of his belief, practiced by the Turks themselves as well as by the other nationalities found in Asiatic Turkey. Unfortunately, he can give no information as to whether this treatment of cuts is followed in Greece, European Turkey, or elsewhere."

This account in turn is corroborated by Marcel Baudouin,<sup>4</sup> who avers that the mandibles of ants and of certain beetles, particularly of the genus *Scarites*, have been thus used for a long time by "les opérateurs arabes" in Algeria, in Asiatic Turkey by "les barbiers grecs de Smyrne," and that even in Europe such use has been long known and practiced. The beetle used seems to be a nocturnal *Scarites* of the family *Carabidae*, whose mandibles end in small pincers which closely approach each other. His account of this surgical use of ants at Smyrna is as follows:

"Actually still at Smyrna, the Greek barbers, who are there the surgeons of the people, make use of these [insects] for closing different wounds. . . . Their manner of operating does not seem to be the simplest to those who are not used to it. The barber presses together the lips of the wound with his left hand, and applies each ant by means of forceps held in his right hand. The mandibles of the ant being wide open and the animal in a defensive attitude, when the insect is slowly brought to the wound it seizes the outstanding surfaces as soon as it has been brought to them, sinks its mandibles into the flesh on both sides of the wound, and remains in this position, closing each mandible against the other vigorously, and consequently holding the two edges tightly to each other. Then the barber separates the head from the thorax by a snip of the scissors, and the head with its mandibles remains in place, continuing its office though the body has fallen to the ground.

"The same operation is continued with other ants until there are some ten pairs of mandibles placed at regular intervals, and so [the wound in] the skin is stitched together by this ingenious process throughout its whole length. These [mandibles] remain for three days, after which, the uniting [of the lips of the wound] having been brought about, the heads are removed, their office being no longer necessary."

Baudouin's words leave one in doubt whether this is a new account of this phenomenon at Smyrna or a transliteration of Middleton. He does not refer to Middleton by name as he does to every other author whom he quotes, but says that such and such things are done at Smyrna, according to an English entomological periodical." What this is I have not

4. Baudouin, Marcel: L'emploi des fourmis en médecine opératoire, Rev. sc. Bourbonnais. Manlius 11: 252-253, 1898.

1. Beebe, William: The Edge of the Jungle, New York, 1921, p. 178.

2. Mocquerys, Emile: [Quelques détails sur un fourmi du genre *Oecodoma*], Ann. Soc. entomol. France, 1844, Bull., p. lxvii.

3. Middleton, R. M., Jr.: On a Remarkable Use of Ants in Asia Minor, J. Linnaean Soc., London 25: 405, 1896.

been able to find out. Middleton's article appeared in the *Journal of the Linnaean Society of London*. However, Baudouin's data about *Scarites*, as he says plainly, come from Furnari, who will be quoted presently.

Practically the same accounts, with some further historical data referring to such a use of ants in Europe in far distant days, is contained in the important work on intestinal sutures of Felix Terrier and Marcel Baudouin<sup>5</sup> published in the same year. These various data will be taken up in their proper chronological order later.

The account of the use of the beetle *Scarites* goes back to 1845, in which year Salvator Furnari<sup>6</sup> first made known to the world that this beetle is used for suturing wounds. Furnari seems to have gone to Algeria either as surgeon to certain French troops or in some other medical capacity. On his return to France he brought together his medical observations. That part dealing with the use of insects for closing wounds reads as follows:

"In most cases they [the native doctors] have recourse to a procedure, which, although infinitely simple, seems to me very ingenious. This process consists in substituting for the ordinary suture a flesh eating insect known in entomology under the name of *Scarites pyracmon*. This animal, because its two mandibles terminate at their free extremity in two little pincers, is placed on the wound in such a manner that the edges sharp and face to face find themselves between the two pincers which are brought together by the constrictive effort of the insect, and so their union is maintained. Thus, two or three *Scarites* are placed in such a manner as to bring about a continuity of things and afterward by a movement of rotation the thorax is lifted and cut off from the head. But in order to prevent the separation of the mandibles the *thebib* [doctor or medicine man?] covers the articulation made by these organs with a little very adhesive mastic. This precaution is, however, useless, because the head detached from the body preserves such a contraction of the jaws that it is necessary to break the constricted pincers in order to get rid of them.

"This procedure strikes me as very ingenious since it seems that it would be of great utility in those cases of *autoplastie* and *blepharoplastie* where the application of needles and threads is not advisable by reason of the narrowness of the fragment, and since the pincers would not augment the chances of mortification."

Furnari communicated his data to Malgaigne, editor of the *Journal de chirurgie*, in which<sup>7</sup> these data are again set forth at length, especially in relation to the operation for the cure of harelip. This was evidently done that this very curious and interesting practice might be brought to the attention of the French medical men of that day.

#### USE IN LATE MIDDLE AGES AND EARLY RENAISSANCE TIMES

Numbers of writers on the history of medicine and surgery refer in very general and incomplete fashion to the use of ants in operative surgery in Europe in late medieval and early Renaissance times. Sprengel<sup>8</sup> gives the best accounts of this use of ants in Europe. These accounts have not all been verified, since all these books are, so far as I know, to be found in this country only in the Library of the Surgeon General's Office, Washington, and because of their extreme rarity and great value cannot be loaned. However, a number of the originals together with various translations have been consulted in the library of the New York Academy of Medicine and the data to be set forth checked therein. Furthermore, there can be no doubt as to Sprengel's accuracy, since his

accounts check up absolutely not only with the foregoing but also with the accounts of various other medical historians whose works have been consulted. These accounts of this use of ants in Europe will now be set out in a strictly backwardly moving order.

The latest of these old European ant suturers was Leonard Bertapa[g]lia, a professor in the University of Padua in the fifteenth century. He seems never to have had his little work on surgery published separately, but his tract (No. II) "*De Vulneribus*" was incorporated in Guy de Chauliac's "*Cyrurgia*," Venice, 1499, presently to be referred to, and also in two later editions of de Chauliac's book, which appeared at Venice in 1519 and 1546. In Chapter VIII of the "*De Vulneribus*" it is learned that for suturing wounds of the *small intestine* he placed great faith in ants' jaws. This is an entirely new use of ants for suturing wounds, but as will shortly be seen was a widespread one in southern Europe at this time.

Terrier and Baudouin allege that Gabriel Fallopio (1523-1562) "in his work [presumably on wounds] cites the means utilized by the ancients, and among them the use of ants." I have been unable to check this up. Presumably it is contained in his work "*Opuscula tria; Tractatus de Vulneribus*," etc., Venice, 1569. Fallopio, the discoverer of the fallopian tubes, studied medicine and taught at Ferrara, removed to Pisa, and finally became professor of anatomy at Padua, at that time the medical center of Europe and of the world.

Another old surgeon whose work, like Bertapaglia's is also known to us only in Guy de Chauliac's book, is Brunus of Calabria, perhaps better known as Brunus Longoburgensis or Longobucco. He was a friend of Petrarch's and also a professor at Padua, his days falling in the thirteenth century. Beyond the mere statement that he also sutured wounds by the aid of ants, nothing can be given here. His "*Cyrurgica Magna*" was written in 1352, but seems never to have been published separately. It was incorporated under his name in Guy de Chauliac's "*Cyrurgia*," Venice, 1499, and also in the later editions of 1519 and 1546.

A contemporary of Brunus was Mondino (Mondini) da Luzzi, also called Mundinus de Lentiis (1250-1325 or 1326), a distinguished Italian anatomist (said to have been among the first to dissect the human body) and a professor of medicine at Bologna. An edition of his "*Anathomia*" (*Anatonia?*), a little book<sup>9</sup> of twenty-four leaves, is extant bearing neither date nor place of publication, though these are believed to be Leipzig, 1493. An undoubted edition is "*Anothomia*," Venetiis, 1494. Other editions are 1507, 1513 and 1541—all these being in the Surgeon General's Library. Of interest here is the fact that he is said to have continued to sew up wounds of the small intestine with ants' heads even after other sutures had been devised.

The earliest of the medieval ant suturers was Albucasis, an Arabic physician, who lived and practiced in Spain. The date of his birth is not known, but he died in 1122. It is difficult to say when his surgical notes were first published because they may have been embedded in works published from 1484 on, whose titles give no indication of surgical matters. His "*Methodus Medendi*" was issued at Argentoratum in 1532, possibly in an abbreviated form. Certainly a full edition of 335 folio pages bears the imprint Basiliae, 1541. His "*De Chirurgia Arabici et Latini*" (Channing, editor) was printed at Oxford in 1788. A modern French version by Le Clerc is "*La chirurgie d'Albucasis*," Paris, 1861, and from it (Book II, Chapter 87) the following citation is taken. Possibly he is herein referring to the Alexandrine school of empirics, which flourished from about 250 B. C. to 200 A. D.

"Some doctors of the sect of the empirics [experimenters, pragmatists] are reported to make use of the following method of treating intestinal wounds of small extent. They go at the

5. Terrier, Felix; and Baudouin, Marcel: *La suture intestinale, histoire des différentes procedés d'entrophe*, Paris, 1898, pp. 3-4.

6. Furnari, Salvator: *Voyage medical dans l'Afrique septentrionale*, Paris, 1845, pp. 310-312.

7. *J. de chir.*, 2: 118-119, 1845.

8. Sprengel, Wilhelm: *Geschichte des chirurgischen Operationen*, Part 2 of Kurt Sprengel's *Geschichte der Chirurgie*, Halle, 1819, pp. 671, 673, 675, 676, 682, 684.

9. Copies of this are in the library of the New York Academy of Medicine and in the New York Public Library.

matter as follows: They take ants with large heads, bring together the edges of the wound, and apply an ant with gaping mouth to the two lips of the wound. As soon as it has closed its mouth by bringing the mandibles together, they cut off the head, which remains from that time attached to the wound and does not open any more. They then take another ant, which is placed next to the first, and continue to apply others following the line of the wound. They then reduce [the danger of separation] by applying a ligature [plaster?] to the wound. Now these heads remain fast in the intestine until healing has taken place, unless some accident happens to the patient."

#### OPPOSITION TO ANT SUTURES

There are now to be considered five early surgeons whose opposition to wound suturing with ants' jaws finally put an end to this practice. Three of these lived toward the close of medieval times, and two at the beginning of the Renaissance. These will be considered oldest first, since their work and influence were cumulative. The first was Theodoric [1211?-1298]. Theodoric's work was never published separately but was included in Guy de Chauliac's book "Cirurgia," Venice, 1499, 1519 and 1546. Its title page reads in part as follows: "Incepit Cirurgia edita et compilata a divino fratre Theodorico episcopo Cerviense ordinis praedicatorum," from which we gather that he was in holy orders and that he compiled his work from preexisting manuscripts. However, the point at issue here is that Terrier and Baudouin say of Theodoric, "This surgeon, on the other hand, rejects the employment of the heads of ants, the first reaction against the ideas of the Arabs."

The next opponent of ant-head sutures is the man to whose book frequent reference has already been made, Guy de Chauliac (1300-1370), "the Father of Surgery." This distinguished man, also called Guido de Caulaco or Guigo de Chaulaco, was born at Chaulaco, a frontier town of Auvergne, France. He was not a barber-surgeon, but a clerk in holy orders who studied at Montpellier, the center of medical learning in Europe, from which he graduated as "Physicus," after which he was medical attendant to three popes at Avignon—Innocent VI, Urban V and Clement VI. He was the most eminent surgeon of his day in France, indeed, in Europe. His work on surgery ("Grande chirurgie," 1363) which is declared to be not merely the first of its kind in Europe but the most important down to the seventeenth century, is said to have been first published at Lyons, in 1478. Two separate editions of the "Cirurgia" were printed at Venice in 1480 (each of 239 folios, but with variant title pages). However, the edition previously referred to, as including the work of a number of his predecessors, is the "Cirurgia," Venice, 1499.

This work as a whole or in parts went through a multitude of editions, at least fourteen in the fifteenth century (all of which, including the first English version, London, 1541, are among the treasures of the Surgeon General's Library), thirty-eight in the sixteenth century, and seventeen in the seventeenth. Of these, forty-three are in French, sixteen in Latin, five in Italian, five in Spanish and two in English, while the number in German is not given by the authorities. Fuller data about the man and his book may be found in Brennan's<sup>10</sup> translation of "Wounds and Fractures." In the "Third Treatise (Concerning Wounds), Second Doctrine," Chapter VI (p. 120 of Brennan), we read: "And in the large intestines let them be sutured . . . not with ant-head stitches, which some experimenters have done as Albucasis testifies. This is idle and useless as appears from the facts." Sprengel renders this passage (possibly taken from some other edition) "because the nature of the strange bodies was not tolerated by the intestine but they were immediately cast off"—probably as a result of mortification following infection.

Guy is followed, and his opposition to ant sutures added to, by Giovanni di Vigo (1460-1520) an eminent Italian surgeon of his day, who was born at Genoa but who practiced medicine and surgery at Rome, where he was medical attendant to the Pontiff. His book "Practica in Arte Chirurgica" appeared at Rome in 1514. It was a very popular work and passed through many editions (the Surgeon General's Library possesses twenty issued in the fifteen hundreds, including the first English version at London, 1543). Vigo is noted here because he revolted against the use of ants in surgery as an obsolete practice (Book III, Tract I, Chapter II), and the wide distribution and great influence of his book undoubtedly helped greatly in bringing about a discontinuance of the practice.

Vigo, in turn, was followed by Hieronymus Fabricius ab Aquapendente (a good name to roll under the tongue like that "blessed word Mesopotamia"). Fabricius (1537-1619), also a professor at Padua, wrote of the use of ant sutures but discarded these because the mandibles of the ants relaxed in the wounds after the ants were dead and also because the ants themselves could not be obtained in the winter. This is to be found in his "Pentateuchos Cheirurgicum," Francofurti ad Moenum, 1592 (Lib. II, Chapters 45 and 46). His work was also very popular and often republished (thirteen editions being found in the Surgeon General's Library).

The last surgeon (so far as I know) to oppose actively the use of ants in European practice seems to have been Matthäus Gottfried Purmann (1642 or 1649-1711), who practiced surgery at Halberstadt and Breslau and published a little work on surgery in 1686. His larger book, "Chirurgia," appeared in 1690 and passed through a number of editions. He probably finished the work begun by Theodoric and Guy de Chauliac and continued by Giovanni de Vigo and Fabricius ab Aquapendente, by the ridicule which he poured on the practice of using ants' jaws for suturing wounds. From this time on, this use by European surgeons seems to have been discontinued, though Frey<sup>11</sup> tells us that, in a personal communication from a Dalmatian physician, the statement was made that at that time (1895) such use was not infrequent among the common people in Dalmatia.

#### USE OF ANT SUTURES IN INDIA

It is interesting to note here that, so far as the data thus far set forth justify a statement, the use of ants for suturing wounds among civilized people both medieval and modern is confined to the circle of the Mediterranean—Spain, France, Italy in former times; Algeria, Asia Minor, and Dalmatia in recent days—warm regions where ants abound and where they may be obtained throughout the greater part of the year. However, it now becomes necessary for us to turn our attention to a region far distant from the Mediterranean and to a time as far away from Albucasis as the Mediterranean is distant from the Bay of Bengal. For in India the suturing of intestinal wounds by the use of ants antedates the Christian by possibly 1,000 years, and from this region the Arabs probably carried the practice westward. It is of record that both Arabs and Persians, in about the year 600 A. D., had translations of the great Hindoo works on medicine presently to be referred to.

In the early medical writings of the Hindoos are found two distinct references to the suturing of intestinal wounds by the ancient Hindoo practitioners. I have found numerous obscure references to this procedure, but the direct references and statements are contained in Girindranath Mukhopadhyaya's "The Surgical Instruments of the Hindus."<sup>12</sup> The original citations are found in the Atharva Veda, the fourth division of the Vedas or books of knowledge of Sanskrit literature and

10. Brennan, W. A.: Guy de Chauliac (A. D. 1363) On Wounds and Fractures, Chicago, 1923, introduction and p. 120.

11. Von Frey, R.: Ueber die Technik der Darmnaht, Beitr. klein. chir. 14: 3, 1895.

12. Mukhopadhyaya, Girindranath: The Surgical Instruments of the Hindus, Calcutta, 1: 208-209, 1913.

"the oldest literary monument of Indian medicine." The age of the Atharva Veda as generally agreed on is not later than 1000 B. C. and may possibly be earlier.

Chronologically, the later of these two references is to the Susruta Samhita (Susruta Collection of [Medical and Surgical] Knowledge), Book (section or division) IV, Chapters or Lessons ii and xiv—an ancient treatise on Hindoo medicine. Susruta, whose predilection was markedly toward surgery, is said to have been the son of the sage Visamitra and a contemporary of Rama, and is reputed to have studied medicine and surgery under Dhavantari, the Hindoo Aesculapius and King of Benares—Benares being the seat of ancient Hindoo medical science. Mukhopadhyaya says: "Susruta describes the use of living black ants to close incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the scybali, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision, in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them." In another place: "If by any accident the abdominal muscles be incised and the intestines come out of the gaping wound, Susruta recommends us to allow black ants to bite the exposed coils of intestines before replacing them into the abdomen." The latter is not very clear, and furthermore one wonders what becomes of these heads, whether they become absorbed or remain intact and finally become encysted.

As to the date at which Susruta lived, worked and wrote, there is much uncertainty. Mukhopadhyaya has gone pretty thoroughly into this and feels satisfied that the evidence points to the fact that he could not have lived later than 1000 B. C., while he may have flourished earlier. He is one of the three oldest of Hindoo medical sages.

There have been innumerable manuscript copies of Susruta's work made by many commentators, and a considerable number of editions have appeared in Sanskrit. One of these, edited by Sri Mahasudana Gupta in two volumes, was printed at Calcutta in 1835-1836, and another in one volume by Pandit Jibananda Vidyasagara at Calcutta in 1873. F. Hessler published a Latin version in three volumes at Erlangen, 1844-1850, and also a volume of comments and annotations (in Latin) issued in fascicles at Erlangen, 1852-1855. No complete English version exists, so far as I know. U. C. Dutt published the beginning fascicle of an English version at Calcutta in 1883, but died shortly thereafter. A. Chattopadhyay brought out two continuing fascicles in 1891. However, his work was deemed unsatisfactory, and a new translation was begun by Hoernle, and the first parts were issued in the "Bibliotheca Indica" in 1897. This seems to have gotten no further, and so far as I know we have no complete English version.

I have examined all these fascicles, but none of them extend far enough to catch the wanted reference. The only completed edition to which I have had access is F. Hessler's "Susruta's Ayurvedas, Id Est: Medicinæ Systema a Venerabile D'Havantari Demonstratum a Susruta Discipulo Compositum . . . In Latinum Sermonem Veritit Dr. Franciscus Hessler," Erlangen (in parts), 1844-1850. I render Hessler's Latin as follows:<sup>13</sup> "Some say that the intestine has been also bitten together by the great head of an ant." From Chapter XIV, Abdominal Tumors, comes the following: "Likewise in the region of the large intestine, the physician extracts the obstruction, purges the intestine, holds together the incised edge of the intestine, and closes it by having it bitten by black ants. The intestine being bitten, he takes away the bodies of the ants, leaving indeed only their heads and in this old way it is said he brings about the reunion and stitches it."

Older than the Susruta Samhita is the Caraka Samhita. The Hindoo account runs that Brahma or Prajapati, his son,

taught the Ajurveda or Science of Life (in short, medicine), to Daksa. Eventually it came to Indra, who taught a learned sage named Bharadwaja, who in turn became the preceptor of a number of pupils, who reduced this teaching to writing. Of these written accounts, that of Agnivesa was deemed best. Agnivesa's treatise in turn was revised, edited, and probably expanded by Caraka. This, then, is the Hindoo attempt to explain the origin and the undoubted great antiquity of the Caraka Samhita.

Now the name Caraka or Charaka seems to be a generic name or title for the chief court physician of the ancient Hindoo kings, and from the standpoint of chronology the difficulty lies in determining which Caraka is meant. To determine this point is hopeless, and all that can be said is that Hindoo medical tradition and modern research assign this work (originally written, we will presume, by the original Caraka) to great antiquity, certainly placing it anterior to Susruta. In this conclusion Mukhopadhyaya seems to agree since he (like the other authorities) places Caraka as the earliest of Hindoo writers on medicine. Caraka, it may be noted, dealt more with the medical side of the healing art, in contrast with Susruta, who was preeminently a surgeon.

In the Caraka Samhita,<sup>14</sup> we read of the "use of ants for the obliteration of small perforations in the intestines, but he [Caraka] takes away the ants before replacing the gut in the abdominal cavity." This, then, is apparently an older as it certainly is a less definite statement of the use of ants—such a statement as one would expect to find in an older writer compared with later ones.

This citation I have not been able to verify. The New York Public Library contains an English version in fifty-seven parts, publication of which was begun by Avenish Chandra Kaviratna and continued after his death by his son. Whether this is complete or not I cannot say, but as the major divisions are very indistinctly indicated I was unable to locate Book (section or part) VI, Lesson xviii, in which the foregoing imperfect citation is to be found.

#### CONCLUSION

It may be stated that herein are brought together definite citations to show that the use of living ants to bite fast and thus suture wounds persists today in northern South America, was prevalent on the southern and eastern shores of the Mediterranean from eighty years ago down to thirty years ago, was the standard practice in Spain, France and Italy in days just preceding the coming of Renaissance times, and reaches back to remote antiquity in India—that its time span is from 1921 A. D. to 1000 B. C., a range of nearly 3,000 years.

Verily there seems to be nothing new under the sun.

#### INCIDENCE OF ILLNESS IN GENERAL POPULATION

A true picture of the ill health and, therefore, of the problems to be attacked by those who are engaged in preventing disease, is not adequately portrayed by death statistics, observes Edgar Sydenstricker (*Pub. Health Rep.* 40:279 [Feb. 13] 1925). The obvious reason for this is that mortality records by definition do not include the cases of illness that are not fatal, to say nothing of the suffering and the lowered vigor and the lessened efficiency among the living. A study of illness in a general population group in a typical small city not only shows the inadequacy of mortality statistics for this purpose but suggests the kind of picture that complete morbidity records would afford. Looking at it in broad outline only, it was found in the group of persons studied that more than 100 cases of illness occur annually for each death. More than half the morbidity was due to respiratory diseases. The ratio of respiratory illnesses to

13. From the section "Chikitsitast'hana, id est Therapia," Chapter II, On Wounds, p. 63.

14. Caraka Samhita, Book VI, Lesson xviii.

deaths from respiratory causes was more than 300 to 1. Diseases and disorders of the digestive system caused an annual illness rate of 117 per thousand but a mortality rate of less than 1 per thousand, a ratio of about 200 to 1. The "general diseases" epidemic and non-epidemic composed principally of those diseases against which public health effort has been mainly directed caused only 11 per cent. of all illnesses. While deaths occur principally in infancy and in old age, ill health, as measured by the incidence of illness, occurs with comparatively little variation throughout life. It is prevalent among the young, those in the "prime of life," and the aged, without much discrimination.

## Medicolegal

### Procedure After Reinstatement Has Been Refused

(*Russell v. Dibble, Director of Licenses (Wash.)*, 231 Pac. R. 18)

The Supreme Court of Washington says that in 1915 respondent Russell, being then a licensed physician and surgeon in that state, was convicted of the crime of abortion. Later in the year, after a hearing before the board of state medical examiners, an order was entered revoking her license, such action being in accordance with the statutory provision for revocation of license on "conviction of any offense involving moral turpitude," and the order was upheld by the courts. About a year after the revocation of the license, the governor of the state issued to the respondent a pardon. She then petitioned the board to revive her license, on the ground that the pardon had the legal effect of annulling the revocation. The board refused to reinstate her, as it did again something like three years ago. In June, 1924, she petitioned the superior court for a writ of mandate ordering the director of licenses (who under the administrative code now performs the duties formerly imposed on the board of state medical examiners) either to enter her name as a regularly licensed and practicing physician and surgeon, or to show cause why he should not do so. The trial court overruled a demurrer to her petition, and after a hearing on the merits entered a decree which ordered the board of medical examiners to correct their records and reenter her name as a regularly licensed and practicing physician of the state. From this decree the director of licenses, who had been substituted in the stead of the board of medical examiners, appealed; and on that appeal the supreme court holds that his demurrer should have been sustained, reverses the decree of the superior court, and directs that court to dismiss the action.

The supreme court agrees with the contention that the respondent had no right to the writ of mandate, this court having often held that such a writ will not issue if there is a plain, speedy and adequate remedy by appeal.

It was contended that the right of appeal given by the state statute does not apply to facts such as existed here, but applies only where the license is refused or where a license is revoked or suspended. If the act is strictly construed and the words held to their narrow meaning and no effort is made to get at the legislative purpose, it may be that the board of state medical examiners was given power only to issue or refuse to issue original certificates and renewals thereof and suspend and revoke licenses. But it will not do to read the statute too strictly. We must get at the legislative intent. Taking the acts as a whole, it is plain that the legislature intended to vest in the board of state medical examiners full and complete power over the right to practice medicine and surgery in the state, and that was the question involved here. It also seems plain that a right of appeal was given from any order which the board was entitled to make. The respondent's argument would lead to her own destruction, because if this court gave the narrow construction contended for by her, then the demurrer to her petition for the writ of mandamus should have been sustained, because the board of examiners and the director of licenses would have no power

to do the thing which she was demanding of them, and consequently could not be compelled to perform it.

But the supreme court has no doubt that the board of examiners, during its régime, had, and the director of licenses now has, power under the statute to act on the facts existing here, and since a right of appeal was intended to be given from any and all actions of the board or director, it must follow that the respondent had a clear right of appeal from the refusal of the board to reinstate her. Appeal statutes are remedial in their nature and should be liberally construed. If the respondent had appealed from the action of the board, this court would certainly not have thrown her out of court, because so to do would have been to stick in the surface of the question and not go to its heart.

Nor was the right of appeal inadequate, for such delay as would have occurred in that connection would not be unreasonable under the circumstances. Besides this, on appeal the court would have full power to go into the merits of the controversy, because the statute provides that such matters shall be tried de novo (anew), as civil actions are.

### Injuries from Use of Soda Ash Classed as Accidental

(*Ward v. Beatrice Creamery Co. (Okla.)*, 230 Pac. R. 872)

The Supreme Court of Oklahoma says that the plaintiff's petition stated that while he was an employee of the defendant company and working at a place where a high degree of heat was required, in the process of sweetening cream by the use of soda ash he was burned, scalded and salivated, and his body and features were disfigured, whereby he was permanently disabled. To justify his commencing this action in the district court, the plaintiff contended that he was not entitled to recover compensation under the workmen's compensation act, because his injuries were not the result of an accident. The supreme court, however, holds otherwise, and that a demurrer to his petition was properly sustained on the ground that the injuries suffered by him were accidental injuries and as such came within the exclusive jurisdiction of the state industrial commission. While it was true that nothing happened suddenly to the plaintiff, yet his condition was brought about by the continuous use of the soda ash in the heated condition of the place in which he had to work, between the months of June, 1922, and March, 1923. The term "accidental injury," as used in the workmen's compensation act of Oklahoma, must not be given a narrow meaning, but is to receive a broad and liberal construction, with a view of compensating injured employees, when the injury results through some accidental means, was unexpected and undesigned, or may be the result of mere mischance or of miscalculation as to the effect of voluntary action.

### Medical Services for Children of Divorced Parents

(*Ehrich v. Ehrich (N. Y.)*, 207 N. Y. Supp. 219)

The Supreme Court of New York, Appellate Division, Second Department, says that the plaintiff sought to compel the defendant to reimburse her for expenditures made by her for medical services for one of their children, and expenses incidental thereto. The necessity of the services and their efficacy were not denied. The defendant merely said that he should not pay because he did not in advance approve the physician by whom the child's disease was diagnosed or the treatment to which it was afterward submitted. The decree of divorce existing between the plaintiff and the defendant provided that the defendant should properly support, educate and maintain each of their children during minority, but that otherwise the plaintiff should have the sole custody, care and control of the children. The plaintiff's care and control of the children would not be sole if she were obliged to consult the defendant and obtain his consent before she could do anything for the children. That would be joint care and control. No situation could be suggested wherein the exercise of sole control would be more essential than in the selection of a physician and the prompt furnishing of medical treatment. The defendant had been deprived of the right of joint control of the children. The situation of the parties was such that joint control was no longer practicable. The