which were used in the indictment from the questions which were asked. They concern points in the dogma of the Trinity, incarnation and the sacraments. He was questioned whether he had said that Christ and the Apostles were magicians (or sorcerers?), whether he believed in the migration of souls. He was asked, and confessed, that he had taught that fornication was a small sin and had condemned the church in forbidding it. He ("the martyr of science") was accused of defending conjuration. Furthermore, he was questioned about his associations in Geneva and England (where he had written a book "Spaccio della Bestia triofante"—"Expulsion of the Triumphant Beast"—interpreted as aimed at the Church). In the whole interrogation there are only three places which are even slightly bearing on the question of natural science. At the beginning of the interrogation, upon being asked whether he confesses errors, he himself said that he had taught the existence of an infinite number of worlds and that the earth was one of the stars. But this point was not taken up in the questioning, and is not contained in the summing-up of his errors which is given by the court (Previti, p. 351).

The second point was on determinism and was contained in the question whether he had denied Providence (p. 357). Finally, he had at the beginning handed over a list of all his published books. He was asked why this did not contain the book "cena delle ceneri." He answered that this book, published in England, treated of the motion of the earth. No further mention is made of its contents—they had not been questioned (p. 358). Nowhere is there any mention of the Copernican theory in the whole process. In the request for extradition which the Papal Nuncio addressed to Venice, Bruno is accused of his associations in Geneva, France and England, and of heresies concerning the dogma of the incarnation and of the Trinity. No mention whatsoever is made of any physical theory.[3]

The acts of the Roman process are not published, except a few purely formal ones, but as the punishment is one reserved for relapsed heretics one must assume that it went over the same ground as the process of Venice. There do exist documents to show that here too there was no mention of Copernicus' theory. There exists a letter of Gaspare Scioppio (Kaspar Schopp) to Conrad Rittershaus. Schopp[4] was an eye witness of the execution and says that he had heard the sentence proclaimed. According to him, Bruno was condemned because of heresies against the sacraments, the incarnation, because of teaching the transmigration of souls, the innumerability and eternity of the worlds, because of his denial of the divinity of Christ and the statement that Christ and the Apostles were magicians. It is true that the authenticity of this letter is denied by some; however, in a book published eleven years later, he says that Bruno was executed because he did not want to abjure his pagan acceptance of "portenta et monstra" (apparitions), and his statements against Christ and the Apostles (Previti, p. 211).

However, there is another argument which seems to me quite independent of the documents and quite convincing that the condemnation of Bruno had nothing to do with Copernicus' theory, and that is a simple comparison of the dates. Bruno was tried in 1592 and executed in 1600. In 1611 Galileo came triumphantly to Rome, and it was not until 1615 that proceedings against him were begun. It is quite clear that if there had already been proceedings on account of this theory, and if Bruno had been condemned to the stake in 1600 for it, the adversaries which Galileo had before 1615 would have behaved quite differently and would not have failed to point out that he was defending the theory on which the Inquisition had already acted. Galileo himself, of course, would also have behaved quite differently in this case.

As to President Morehouse's remark, "the second martyr of the Jesuits," it might be said that on the Roman tribunal of sixteen judges there were 12 seculars, 3 Dominicans (Bruno's own order) 1 other monk and 1 (!) Jesuit.

Bruno might perhaps be called a martyr to Pantheism, to Buddhism, to Unitarianism, but surely not to science.

K. F. HERZFELD
THE JOHNS HOPKINS UNIVERSITY

[3] It will be found that this presentation agrees with the one in T. L. MacIntyre, Giordano Bruno, London, 1903, although this author is very favorable to Bruno.

[4] This letter can be found in Previti's book on page 440.

A SMALL INSECT WHICH STINGS SEVERELY

IN November, 1925, a minute black hymenopterous insect, scientifically known as *Epyris californicus* (Ashmead), was first sent to the University of California by a farmer at Clarksburg, Yolo County, California, with the statement that it had severely stung a child several times and was the cause of severe pain and considerable inflammation. Due to the fact that the insect in question is barely over 5 mm in length, the idea of its being so formidable was doubted. Specimens forwarded to the Bureau of Entomology were determined as the above by S. A. Rohwer, who stated that they were the only other ones seen up to that time which agreed with the original types.[1] Although informed that probably

[1] W. H. Ashmead described the species as *Mesitius californicus* from several specimens taken in California

some other insect was responsible for the injuries to the child, the farmer insisted that he had sent the real culprit.

In October, 1928, more specimens of the same insect were received from Davis, California, with a similar claim that they were stinging children, and particularly a small infant in its crib. To make sure of the exact identification, specimens were again sent to the Bureau of Entomology and determined as the above by A. B. Gahan. By this time I was beginning to suspect that this small parasite was assuming a new rôle, but there was no way to prove or disprove the suspicions. Additional information concerning this interesting insect was received on October 16, 1930, from Frank B. Hopkins, a teacher of biology in the Esparto Union High School, Esparto, California, who wrote as follows: "I am sending a box containing a little vial in which are four or five little Hymenoptera. Will you please tell me what you think they are? They were handed to me by a lady here, who is frequently stung by them so badly they make her ill. The first time she was stung (she was alone), she went into a heart attack and nearly died. She managed to call help, however, and when the physician came he administered strychnine. She continues to keep the drug by her, but usually applies alcohol to allay the sting. The house is surrounded by large walnut and Mission fig trees. This is the only case of the kind in the community of which I can learn."

A few days later another case was reported at Woodland, California, by an attending physician, who submitted specimens to Dr. Tracy I. Storer, of the University of California at Davis, which later came into my hands for verification.

All these cases were reported from a comparatively small area in Yolo County and to date no such reports have come from any other county in California, nor have I noted similar records from any other state or country.

The evidence at hand indicates beyond doubt that *Epyris californicus* stings humans, both young and adult; that it is able to inflict considerable pain and inflammation; that its activities are at present quite restricted as to localities; and that its attacks are sporadic and uncommon. Concerning the life history and habits of this particular species, beyond its propensity for stinging, absolutely nothing is known. According to Imms,[2] *"Epyris* stings Tenebrionid larvae and lays a single egg on each." In California Tenebrionid beetles are abundant and perhaps furnish the natural food supply for this hymenopterous parasite.

E. O. ESSIG

UNIVERSITY OF CALIFORNIA

in his Monograph of the North American Proctotrypidae, Bul. 45, U. S. Nat. Mus., pp. 65–66, 1893. It is now placed in the family Bethylidae, superfamily Proctotrupoidea.

[2] A. D. Imms, "A General Text-book of Entomology" (Dutton, N. Y., 1930), ed. 2, p. 574.

HAMIVOROUS FISH

IN the November 20, 1931, issue of SCIENCE, Mr. C. T. Hurst directed attention (on page 515) to "a quite curious case of gastric erosion of a fish hook that had been swallowed by a fish."

Upon its appearance, I showed this fish story to Dr. Charles Reitell, the well-known ichthyophile and the author of "Let's Go Fishing." He said immediately: "Any one who fishes for pickerel as much as I do finds it quite a common experience to discover old hooks in the anatomy of this fish. Because of his sharp teeth, he often saws off the line or gut. More than once I have found trebled hooks deeply imbedded in the throat of a pickerel which, with the very slightest pressure, were crushed."

The experience of Dr. Reitell, then, confirms in general Mr. Hurst's report.

W. A. HAMOR

MELLON INSTITUTE

RELATIONS BETWEEN FUNDAMENTAL PHYSICAL CONSTANTS

A NUMERICAL relation has been found between the fundamental physical constants shown below and the velocity of light. This relationship is of such a nature that the constants can be calculated from a single equation $1/2\pi c = C^{12}$ and the power of the velocity of light shown, provided the decimal point is ignored. A complete solution of the relation given, enabling the decimal point to be properly placed, has not yet been found. It is, however, not possible that any merely accidental agreement could produce the numerical agreement shown below. The facts concerned will be presented in a more technical paper.

CALCULATION OF FUNDAMENTAL PHYSICAL CONSTANTS

		Observed	Calculated
C	C	$(2.99796 \pm 0.00004) \times 10^{10}$	2.99960
C^2	m_o	$(8.994 \pm 0.014) \times 10^{-28}$	8.99761
C^6	$1/k$	$(7.294 \pm 0.0074) \times 10^{15}$	7.28415
C^8	h	$(6.547 \pm 0.008) \times 10^{-27}$	6.55402
C^{14}	ε	$(4.770 \pm 0.005) \times 10^{-10}$	4.77401
C^{24}	m_P	$(1.6610 \pm 0.0017) \times 10^{-24}$	1.66014
C^{26}	$\frac{1}{G}$	$(1.5006 \pm 0.0005) \times 10^{7}$	1.49373

π = Geometrical Constant; C = Velocity of light; m_o = Mass of electron; m_P = Mass of proton; h = Planck's Constant; ε = Electronic charge; G = Gravitation Constant; k = Boltzmann Constant.

J. E. MILLS

UNIVERSITY OF SOUTH CAROLINA

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