TABLE I

ASTROPHYSICAL JOURNAL—FOREIGN SUBSCRIPTIONS

Country	Present subscribers	Number discontinued since 1931
Canada	16	3
Australia	12	1
South Africa	8	2
East Africa	1	..
Belgium	5	..
Bulgaria	..	1
Austria	3	2
Egypt	2	1
Denmark	3	3
Czechoslovakia	6	1
China	4	16
Ceylon	1	..
England	34	12
Estonia	..	1
France	16	5
Finland	1	..
Germany	48	21
Greece	..	1
India	23	2
Hungary	1	..
Netherlands	7	5
Italy	11	7
Ireland	5	2
Japan	36	33
Poland	6	4
Portugal	..	1
Palestine	1	1
Norway	1	2
New Zealand	3	1
Manchuria	1	..
Lithuania	1	1
Latvia	1	1
Korea	1	..
Jugoslavia	1	3
Java	1	..
Sweden	5	2
Siam	2	..
Scotland	7	6
Rumania	2	..
Russia	13	29
Spain	..	2
Syria	1	..
Switzerland	5	4
Turkey	..	2
Chile	1	..
Brazil	1	2
Argentina	2	3
Philippine Islands	2	..
Mexico	3	1
Cuba	1	..
Samoa	..	1
Wales	2	2

An analysis (Table 1) of recent and former mailing lists of the *Astrophysical Journal* reveals an alarming decline in foreign subscriptions. While the subscriptions in the United States in March of 1938 are practically identical with those of 1928, the foreign subscriptions have decreased by about one quarter. A breakdown by countries shows that the decline was 80 per cent. in China, nearly 70 per cent. in Russia, nearly 50 per cent. in Japan, about 40 per cent. in Italy and over 30 per cent. in Germany. Spain, Portugal, Greece and a few other countries, formerly represented by one or two subscriptions each, have dropped out completely. The decrease was relatively small in France, 24 per cent.; in England, 26 per cent.; and in the British dominions, 12 per cent. The general trend, which is shown by these figures, is so unmistakable as to arouse serious concern over the future of international cooperation in astronomy.

Since no other science depends upon universal cooperation to the same extent as does astronomy, it is quite natural that the effects of nationalistic trends in many countries are more acutely felt by the astronomers than by representatives of other sciences. During the world war, and again during the period of inflation in central Europe, many European observatories were unable to obtain American periodicals and observatory publications, and many years were required to build up the leading scientific libraries in central Europe. Immediately after the world war, the Germanistic Society of America undertook to pay for many subscriptions in Germany and Austria, and credit was extended to numerous institutions in Europe by the University of Chicago Press. It is unlikely that similar efforts will now be made on behalf of Chinese, Japanese, Russian and other scientific institutions.

Although the decline in foreign subscriptions will seriously interfere with the progress of American scientific journals, it should be pointed out that our domestic subscriptions are large enough to safeguard their existence. The *Astrophysical Journal* has in recent years been increased in size, and it has, we hope, been maintained on the same high level on which it was started by George E. Hale in 1895. At the same time the subscription price is considerably lower than that of several European journals of the same character. The problem is, therefore, not primarily concerned with the financial status of the journals. It is much more a question of maintaining the channels for the exchange of scientific information between America and other countries. It is difficult to ascertain all the causes for the decline. Financial difficulties arising from militaristic tendencies account for part of it; increased difficulties imposed by foreign governments upon the purchase of periodicals from abroad has doubtless discouraged a number of subscribers. It is to be hoped that international organizations such as the international scientific unions will take notice of this threat to international cooperation and will urge upon their members the necessity of continuing the exchange of scientific publications.

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SNOWSLIDE EROSION

A HURRIED visit was made on July 17, 1937, to the eastern base of Mount Jackson in Glacier National Park to examine the site of snowslide striations and boulders which had been noted previously.[1] A large number of new grooves were found to have been cut since the previous summer, many of which, like those seen in 1936, had retained boulders at their terminations.

Much of the higher portion of the limestone surface

[1] J. L. Dyson, *Jour. Geol.*, 45: 5, 549–557, 1937.

on which the striations and boulders occur was snow-covered in 1937. A film of melt water covering the lower surface partly obscured the striations and prevented the taking of photographs. However, the many new striations and associated boulders provided unmistakable evidence that snow sliding during the past winter had actually produced results similar to those noted the year before and then inferred to have had such an origin.

Further, many of the new grooves exhibited a characteristic not previously seen. This new type terminated in a distinctly zigzag course (Fig. 1) at the

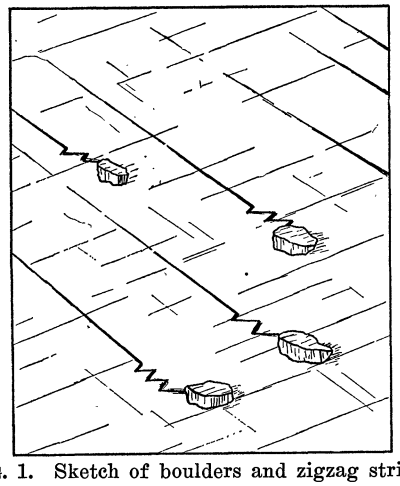

FIG. 1. Sketch of boulders and zigzag striae.

lower end adjacent to the boulder which produced it. A completely adequate explanation for such a termination has not been reached. It is presumed that the zigzags are due to sudden cessation in motion of a relatively fast-moving snowslide. This interpretation is in agreement with the writer's deductions[2] regarding the general nature of the phenomenon developed after the first study of the site.

A somewhat similar occurrence of striations has been described by Gakuro Imamura[3] from the Japanese Alps. These striations, Imamura states, are nivational in origin, new ones being formed each year. In a later paper[4] (pp. 11, 37 and 53) he mentions nivational moraines as being common and conspicuous features in the vicinity of the striations and elsewhere. From this it may be inferred that the moraines are composed, in part at least, of the materials responsible for engraving the grooves which Imamura records.

These findings of Imamura and the writer can not help but disprove the belief, still held by some, that well-defined striations on bed-rock are ultimately conclusive evidence of the former presence of glaciers.

[2] *Op. cit.*, p. 556.

[3] Gakuro Imamura and Takeo Hirabayasi, *Proc. Imp. Acad. Japan*, 11: 8, 331–333, 1935.

[4] Gakuro Imamura, *Sc. Rep. Tokyo Bunrika Daigaku*, Sect. C, 2: 7, 1937.

It is hoped that among the readers of SCIENCE there may be some one who can further elucidate the zigzags.

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A NEW LOCALITY FOR TRYPANOSOMA CRUZI CHAGAS IN CALIFORNIA[1]

AMERICAN human trypanosomiasis is an incurable disease caused by the protozoan, *Trypanosoma cruzi* Chagas, and has been known in South America since 1909. It was discovered by Kofoid and Donat[2] in San Diego County, California, in the western cone-nose bug, *Triatoma protracta* (Uhler), and by Kofoid and Whitaker[3] in the cone-nose bug, *Triatoma uhleri* Neiva, from Tucson, Arizona.

During August, 1937, 152 *Triatoma protracta* (24 adults, 128 nymphs) were collected from woodrat nests in Eaton Canyon, between Altadena and Sierra Madre, Los Angeles County, California. Fifty-seven bugs (12 adults, 45 nymphs) or 37.5 per cent. were infected with a trypanosome.

To determine the identity of this trypanosome, two southern parasitic mice, *Peromyscus californicus insignis* Rhoads, were inoculated intramuscularly with feces from the infected bugs. Both mice were adult females, showing no protozoa in their peripheral blood before inoculation. Fresh blood examinations of one mouse showed: 5th and 7th days, negative; 9th, 6 long slender trypanosomes; 11th, 1 trypanosome; 13th, 1 trypanosome; 15th and 17th, negative; 19th, 1 trypanosome. Fecal samples of four non-infected *Triatoma protracta* (2 adults, 2 nymphs) which were fed on this mouse on the 19th day showed heavy infections with crithidias and trypanosomes 53 days later. Fresh blood examinations of the second mouse showed: 5th, 7th, and 9th days, negative; 11th, 1 trypanosome; 12th, 2 trypanosomes; 13th, negative. Fecal samples of three non-infected nymphs of *Triatoma protracta*, fed on this mouse on the 13th day, showed infections with crithidias and trypanosomes 56 days later.

On the basis of the morphology and characteristic locomotion of the living organisms in fresh mouse blood and *Triatoma* feces, their structural appearance in stained smears of feces of naturally and experimentally infected bugs, their transmissibility from infected to non-infected bugs through a mammal host, the degree of polychromasia and the differential blood picture in the infected mammal, it is concluded that this flagellate is a non-virulent form of *Trypanosoma cruzi* Chagas. These findings extend the known range

[1] The writer wishes to thank the University of California at Los Angeles for use of equipment and materials in the Department of Zoology.

[2] C. A. Kofoid and F. Donat, *Calif. and West. Med.*, 38: 245–249, 1933.

[3] C. A. Kofoid and B. G. Whitaker, *Jour. Parasit.*, 22: 259–263, 1936.