

The survey of glaciers [continued]

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LA SEMAINE DE 40 HEURES EN SUISSE.

Mercredi matin, le Conseil national a entendu M. Graber développer une motion tendant à introduire la semaine maximum de quarante heures dans les fabriques, et son collègue Grosperrière défendre un vœu tendant à limiter la durée du travail dans les arts et métiers, ainsi que dans les banques et les administrations.

Le député socialiste neuchâtelois estime que la crise économique universelle est due en premier lieu à la surproduction, ce qui est une conception quelque peu simpliste. Il faut évidemment compter aussi avec les destructions de capitaux causées par la guerre — qui ont provoqué une crise de consommation — et avec la concurrence des autres continents, notamment de l'Extrême-Orient, où les salaires sont dérisoires. Quant aux arguments avancés par M. Grosperrière, ils étaient élayés non sur une étude de la crise, mais sur l'idée bien naturelle d'égaliser les conditions de travail dans toutes les branches d'activité nationales.

M. Schulthess, président de la Confédération, répondant à M. Graber, s'est placé essentiellement au point de vue pratique. La semaine de quarante heures, dit-il, conduirait à renchérir sensiblement nos produits industriels, au risque de rendre nos fabriques incapables de lutter contre la concurrence étrangère. Ce problème, ajouta-t-il, ne peut être résolu que par une entente internationale. Or, plusieurs gouvernements ne veulent pas entendre parler de cette solution, et l'Allemagne a quitté la conférence internationale du travail, de sorte que nous ne pouvons guère compter sur l'appui de notre principale concurrente.

Le président de la Confédération se montra sympathique à la proposition de M. Grosperrière, mais ajouta qu'il serait peut-être imprudent de vouloir résoudre ce problème au beau milieu d'une crise économique.

Avec une grande compétence doublée d'un sens très vivant des réalités, MM. Gafner, agrarien, et Stampfli, radical, combattirent ces propositions, qui trouvèrent en revanche l'appui de M. Hg, collectiviste, et de M. Arnold, communiste. M. Graber se fâcha quelque peu, en soulevant tout de go le vaste problème de la lutte contre le chômage, que le régime actuel serait incapable de résoudre. M. Schulthess, très posément, répliqua que le Conseil fédéral est loin d'assister avec indifférence à cette plaie sociale, qu'il étudie notamment le point de savoir en quelle mesure la Confédération pourrait aider les industries, notamment celles qui sont spécialisées dans l'exportation.

THE SURVEY OF GLACIERS.

By A. E. H. Tutton, D.Sc., F.R.S.

(Continued).

The readings were undertaken by the guardian of the Cabane Panossière, especial care being taken to get the spring, summer and autumn snowfalls, and to determine the net annual residue of *enneigement*. Several times in the intervening thirty years this nivometer has been laid absolutely bare, but generally there was a clear residue of snow recordable. In 1931, as illustrating modern innovations, Professor Mercanton, piloted by Robert Favre, who was afterwards killed, flew four times over the Col d'Orny, and read the nivometer and actually photographed it from the air. To approach near enough was a very risky business, but it was successfully accomplished. The possibility had been shown in the previous year by the intrepid aviator Cdet, who actually landed on the snow adjoining the nivometer. Many other nivometers and "balise" scales have been painted on rocks, or erected, on other glaciers, notably on the Col de Berthol, the Diablereta, and the Jungfraujoeh.

The cryocinometer of Professeur Mercanton, for the determination of the minute daily movement of the actual snout-end of a glacier, as used by him this present year (1933), is a simple but most efficient little instrument. All of it packs into a box only seven by five by three inches in size, and thus easily goes into the rucksack or even a large pocket. It consists of a brass tube, just over an inch in diameter and closed at one end, and having a small hole bored through the cylinder wall near the other end, through which a fine silver wire can be inserted. The cylinder is to be sunk in a hole bored in the ice by a bracebit of the same diameter (the bit being supplied), and filled with a salt-and ice freezing mixture. The wire is inserted through the little hole in the cylinder, and as soon as it has frozen hard and fast the wire is led horizontally to and wound several times over and round a little pulley, and then hangs down and becomes stretched taut by a

Ce débat fut clos par l'adoption des deux propositions, la motion de M. Graber ayant été transformée, à la demande de M. Schulthess, en un simple vœu.

Le président de la Confédération s'est déclaré opposé aux travaux de chômage, parce que leur utilité serait souvent contestable. Cependant il n'a pas mentionné les 82 millions de francs demandés pour l'acquisition de matériel militaire. N'existe-t-il pas, par ailleurs, d'autres travaux indispensables à effectuer dans le pays? La correction des eaux du Jura, par exemple, s'imposera un jour ou l'autre, et l'on aurait sans doute déjà passé aux actes sans l'opposition de quelques Neuchâtelois, que M. Graber ferait peut-être bien de convertir.

Il ne serait peut-être pas très difficile, avec un peu de bonne volonté, de trouver des travaux de chômage dont l'utilité et le rendement économique sont indiscutables.

R. Bovet-Grisel.

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This excellent little book edited by M. R. Hoffmann-de Visme is now on sale, and can be obtained at our offices. The price per copy is 3/- including postage, a number of copies bound in velvet leather are now available at the Price of 5/3 including postage. Owing to lack of time, we were unable to review the book in this number, but same will appear in next Saturday's issue.

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Very dull and very sad
When the world looks black and dreary
Full of woe and full of bad,
Try the cure to kneel on pease
To penalize the moody sloth
Or to regain your former ease
The use of lashes or the rod,
As mind and corps revive
Nothing has such quick reaction,
One more way, by far the wiser
Wholly free from drastic action
Compile a note of gloom and gist
Set it afire, let it flame,
A flash, the smoke and trouble shift
The world looks bright and good again.

H.E.

weight adequate for the purpose attached to its end. The pulley is carried by an axle projecting from a small metal case carrying clockwork gear for magnifying very considerably the motion of the pulley, and a couple of indicator dials on the other side of the box afford clear indications of the amount of movement (the magnification being taken into consideration); one indicates the units and the other registers the decimals of centimetres. The case of clockwork is to be very rigidly mounted by a clamp provided, on either an ordinary photographic tripod or even an ice-axe head, firmly planted or fixed in front of the snout-end of the glacier.

The surface and end movements are thus now accurately determinable and well known, but the movements in the depths of glaciers are still very obscure. In 1928 Professor Mercanton and his associates deposited nineteen 75mm. shells in the Rhone glacier, each containing an identity piece sealed in by a screwed stopper, and having a sequence number deeply engraved on the outside of the shell. It is hoped that they will long resist attack in the interior of the ice, and also erosion by the rocky bed when they reach it, and that they may afford testimonies of the movements of the glacier for many years to come; their exact position have been accurately determined by the theodolite on placing them, with reference to fixed marks on the adjacent rocks. Similar shell deposits have also been made in the Great Aletsch glacier, both under the Jungfraujoeh on the Eggishorn side and on the Bernese side.

Precise determinations of the thickness of glaciers have been of much rarer occurrence; those of Agassiz on the Unteraar, of Mougin and Bernard on the Tete Rousse, of Hess and Blümcke on the Hintereisferner, and of Vallot on the Mer de Glace, are the outstanding ones. Attempts of later years to employ the new methods of depth-sounding in water (hydrophones, ultrasones, vibratory quartz-plate piezo-electric devices, etc.), have not met with the hoped for success. For glacier ice is not homogeneous like water, and wave-motion within it is subject to far greater degrees of absorption. Better results have been

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afforded by use of the geophones of Professor Jean Perrin of the Collège de France, such as were used by the sappers in the war to localize enemy saps. The Rhone and Corbassière glaciers were thus investigated by Professor Mercanton. On the latter glacier, near the Cabane Panossière, at 22 metres from the right bank of the glacier, the best of three explosions of cheddite gave the echo from the bed at 0.08 second, and assuming the correctness of the previously determined rate of propagation of the sound wave, 1.9 km/s., the result was 102 metres for the depth of the glacier bed. For the sake of confirmation the formula of Professor Somigliana was used in another calculation and gave 107 metres as the depth, a fairly good agreement.

On the Lower Grindelwald glacier, near Baregg, echoes corresponding to depths of 114 metres were obtained, which again agreed with the results of calculations made by use of the Somigliana formula. These thicknesses are of course, much smaller than the large value of 200 metres found by M. Joseph Vallot on the Mer de Glace, and subsequently confirmed by the surveyors of the French Department des Auz et Forêts.

The problem of the thickness of a glacier has, however, at last been satisfactorily solved by the use of a specially modified form of earthquake seismometer (having a photographic recorder for the vertical component, and a microphonic seismograph), by Dr. Mothe. He first tried it on the Hintereisferner, the thickness of which was approximately known from the work of Hess and Blümcke. The velocity of propagation of the explosion waves, produced by the firing of loudly detonating explosives at the surface, proved to be 3,400 m./s. for the longitudinal waves and 1,600 m./s. for the transverse vibrations, and the echoes recorded by the seismograph indicated a depth of the glacier bed in good agreement with the value of Hess and Blümcke. In February, 1929, Dr. Mothe carried out similar seismographic determinations on the Great Aletsch glacier, and found near the Concordia hut a depth of no less than 700 metres.

As regards the general results of glacier survey, the following table shows the conditions for one hundred Swiss glaciers in the years 1926 to 1932:—

Year.	Growing (advancing).	Stationery.	Decreasing (in retreat).
1926	52	3	40
1927	22	7	71
1928	14	5	81
1929	11	12	77
1930	8	12	80
1931	22	12	66
1932	13	7	80

There had been a general advance of the Swiss glaciers in the second decade of the twentieth century, coinciding with an augmentation of the snowfall on the high mountains and a lowering of the summer temperature. The general retreat shown in the above table for the third decade has corresponded with an accentuation of the summer heat, and not with any sensible diminution of precipitation. Hence the essential factor of variation would appear to be the temperature of the summer season. This was indicated long ago by the late Professor Forel shortly before his lamented death, and has now been definitely established, both by the above results and by Dr. Billwiller in a detailed discussion of the subject in a report in the Annales de l'Intitut Fédéral Suisse de Météorologie, 1933.

During this third decade the Savoy glaciers of the Chain of Mont Blanc have also been in retreat, but the change has now again arrived. For when the writer was at Chamonix in June 1933, the Glacier des Bossons, the Mer de Glace, the Glacier d'Argentière, and the Glacier de Taconnay, all of which he personally visited, were again advancing, a fact confirmed by the Guide Chef, M. Balmat. The retreat of the Bossons glacier had been so great that the lower reach of the icefall, which some years ago had actually come down on to the green meadows of the Chamonix valley, had almost disappeared up its ravine.

Surveys in Switzerland.

The movements of some of the more important Swiss glaciers have been measured during the last three years. The exceptional advance of the Lower Grindelwald glacier has been the most outstanding occurrence. It receded eight and a half metres in 1930, but advanced five metres in 1931 and three metres in 1932. The Rhone glacier, in receding sixteen metres per annum during the last two years, has lost much of its celebrated beauty and also its famous ice cave. It may be remarked before concluding that an average of one hundred Swiss glaciers have been observed every year (varying from ninetyfive in 1926 to 108 in 1932). Similar regular work has been carried out on the glaciers of Savoy and Dauphiny, and on those on the Italian sides of the Mont Blanc and Mont Rosa-Matterhorn chains. The total value of this immense glaciological research is beyond estimation, not only in advancing pure knowledge, but in the prevention of disastrous calamities such as formerly occurred with distressing regularity.

A striking instance of the latter beneficent effect may aptly be referred to in conclusion. The shocking disasters in the Vallee de Bagnes of 1818 and 1898, both in the month of June, when lakes which had formed in the Glaciers du Gétroz and Grête-Seche suddenly burst and deluged the valley as far almost as Martigny, caused appalling destruction and loss of life; they are still remembered with fear by the inhabitants of the beautiful valley. In the latter and relatively smaller catastrophe no less than a million cubic feet of water were suddenly let loose. This menace has since threatened time after time, but owing to the constant observation and the construction of siphoning trenches since the year 1899, and their careful supervision and clearing of obstructions, the menace has been averted.

Discovery.

Basel und London, in Dezember 1933.

P.P.

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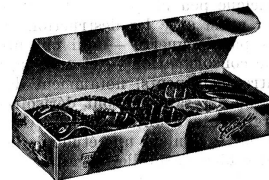
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Locarno2	Winterthur0
Luzern1	Grasshoppers4
Servette8	Olten1
Montreux4	Monthey0

A fortnight ago, Bern beat Biel 3:1 in a League game and now they find themselves knocked out of the Cup by a complete reversal of form. I am sure Biel would rather have it that way; there is glory and money in the Cup! As usual not many of the "lesser fry" fought their way into the last eight; this year six are of the National League, F.C. Brühl is the sole survivor of the First League and Montreux represent the lowly League II where they are making a glorious fight to get back to the First League at the first attempt.

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Bellinzona1	St. Gallen0
Juventus3	Brühl2
Seebach2	Aarau2
Grenchen2	Carouge0
Fribourg3	Etoile Ch.-de-F.2

I am sorry to see St. Gallen beaten for the first time this season in a League game. Their visitors, Bellinzona displace them from second place with 10 points, on account of a slightly better goal average; Brühl 9 points is now fourth, Juventus fifth, 8 points, with a match in hand and a chance to get even to second place yet at the halfway stage. Kreuzlingen thus have a clear lead of 2 points in group East.

In group West there are still four matches to be played and whilst Carouge in spite of their defeat still lead with 11 points, Monthey has a good chance to catch up. Etoile Ch.-de-F. third, 3 points behind the leaders.

M.G.

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FORTHCOMING EVENTS.

Monday, December 18th, at 6.30 p.m. — Swiss Y.M.C.A. — Christmas Celebration — at 15, Upper Bedford Place, Russell Square, W.C.1. (Everybody cordially invited).

Wednesday, December 20th, at 7.45 p.m. — Monthly Meeting — Nouvelle Société Helvétique — at 34/35, Fitzroy Square, W. No lecture. Annual General Meeting, January 17th, 1934.

Saturday, January 6th, 1934, from 7 to 1 a.m., Fancy Dress Ball — Swiss Mercantile Society Ltd. — at the Midland Grand Hotel, St. Pancras Station, N.W. (See advert.).

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Sonntagsschule.

7 Uhr abends, Gottesdienst.

8 Uhr, Chorprobe.

Sonntag, den 24. Dezember, nachm. 4 Uhr: *Weihnachtsbaum* in der Kirche. — Der Morgengottesdienst fällt aus.

BEERDIGUNG.

Am 12. Dezember wurde bestattet Schwester Margaretha Staehelin, von Basel (Stadt); geb. am 12.1.1895, gestorben am 7.12.1933.

Anfragen wegen Religions-bezw. Confirmandenstunden und Amtshandlungen sind erbeten an den Pfarrer der Gemeinde: C. Th. Hahn, 43, Priory Road, Bedford Park, W.4 (Telephon: Chiswick 4156). Sprechstunden: Dienstag 12-2 Uhr in der Kirche; Mittwoch 5-6 Uhr im "Foyer Suisse."