

## A PANORAMA OF THE HINDU KUSH

BY GERALD GRUBER

*(Translated by Hugh Merrick\*)**(Two illustrations: nos. 1-2)*

## INTRODUCTION AND PLAN

WHEN we started from Graz on our third Hindu Kush journey in July, 1965, we did not suspect what interesting results the journey would bring. After our parties of the Hochtouristengruppe Steiermark had successfully made the ascent of Noshaq from the Wakhan in 1963<sup>1</sup> and in the following year had climbed Nadir Shah, Shachaur and Udren Zom from the south,<sup>2</sup> our 1965 expedition ought to have gone to the basin of the Tirich Mir glacier, but on several grounds, due in part to reasons in Austria and in part to the strained relations between India and Pakistan, we had to abandon the plan and turned our attention to the alternative aim, the Buni Zom group.

We had noticed these mountains in 1964 when crossing the Zani Pass on our way to Chitral. They lie south of the main ridge of the Hindu Kush and of the Chitral valley and are regarded as part of the Hindu Raj.

In addition to the ascent of the highest summit—6553 m.—the programme included a geological survey of the region by our geologist, Dr. Herfried Gamerith. I myself had the idea of taking again, with modern photographic apparatus, the panorama photographed by J. R. G. Finch in 1938 and reproduced in *H. J.* 17. 117. Furthermore, I planned to carry out a theodolite survey, as we had noticed both in 1963 and 1964 that there appeared to be in some cases considerable discrepancies between heights given on the map and the true altitudes of some of the peaks in the central portion of the eastern Hindu Kush, e.g. Nadir Shah or Koh-i-Kishmi-Khan, and during the Hindu Kush meeting at Salzburg in 1964 we heard observations on this question of heights by some of those taking part.

Perhaps it was as well for the smooth running of the expedition and the results obtained that we did not know at our departure that two New Zealand climbers had reached the summit of Buni Zom in 1957.<sup>3</sup> I first heard of this ascent from Dr. Diemberger in October, 1965, when he himself had only recently learned of it.

\* Except for the first two short sections, which it was originally intended to omit for reasons of space. Once again, I am most grateful to Mr. Merrick for his translations in this number.—EDITOR.

<sup>1</sup> *The Mountain World*, 1964-65, p. 34.

<sup>2</sup> *Ibid.*, p. 36.

<sup>3</sup> *N.Z.A. J.* 17. 287.

## THE EXPEDITION

As in past years, we did the journey in both directions in two Volkswagen buses. The members of the expedition were: Hanns Schell, Dr. Norbert Zernig, Dr. Herfried Gamerith, Gertraud Gamerith, Hildegund Gruber and the writer. Between Istanbul and Ankara we met Kurt Diemberger's party and we travelled on together to Teheran, where we separated as Kurt was held up by trouble with his vehicles. By way of Baluchistan and Lahore we reached North-west Pakistan.

We left our vehicles at Kalam (Swat) and went on with our porters to Sor Laspur over the Katschkane Pass (c. 4700 m.), known to the local inhabitants as the Katscha Koni. From Sor Laspur we reached Kulakmali in a single day's march. Here, at about 4000 m., we established our Base Camp on July 31, 1965. We got on to the Khorabohrt glacier by a steep rock couloir. We pitched three camps at 4900 m., 5500 m, and 5700 m., before we reached the foot of the ice-wall leading up to the saddle between the north and highest summits of Buni Zom.

Our first attempt, on August 4, was defeated by the deep snow. The weather was often bad; it even snowed as low as the Base Camp and the mountains were hidden in the clouds.

On August 5 I stood with Hanns Schell on the summit of Khorabohrt Dhar (c. 5700 m.) and three days later repeated the ascent with the two ladies, the rest of the party having meanwhile made an unsuccessful attempt on another high summit. Khorabohrt Dhar is the ridge bounding the glacier of the same name on the north and from which a steep descent falls to the Chitral valley. From this ridge I took the panorama accompanying this article and made my theodolite measurements.

On August 10 we made another attempt on Buni Zom but bad weather set in again before we had reached the saddle between the two peaks. The snow was very deep and we made slow progress. Since it was already too late to go for the highest peak we decided to attempt the North peak and Schell, Gamerith and I reached the top (6338 m.) in a snow-storm at about 4 p.m.

On their ascent of Buni Zom the New Zealanders, starting from the Gordoghan glacier (east of the Khorabohrt glacier), may have reached the North Peak and crossed it in the direction of the highest summit.

After Finch's 1938 attempt,<sup>4</sup> Lt. Col. M. W. White and J. Edelmann, with Tenzing Norkay and Ang Tenzing, made an attempt by the route we followed. An adequate account of their expedition does not appear to be available.

We descended from the North peak straight down an ice-slope to the Khorabohrt glacier, abseiling down the last 100 m.

<sup>4</sup> *H.J.* 17. 115.

On August 8 Zernig reached the summit of Khorabohrt (c. 5850 m.), which lies north of the junction of the west and north-east branches of the Khorabohrt glacier.

The continual snow-fall and avalanches prevented our carrying out any further ascents in the time at our disposal and so we struck camp. Meanwhile Gamerith finished his survey. We were down in the valley by August 21 and returned to our vehicles by the route we had followed on the outward journey.

## THE PANORAMA

### 1. *The Measurements*

The appended panorama shows about 100 kilometres of the High (Eastern) Hindu Kush between Tirich Mir and the Lunkho group. It covers an arc of  $106^{\circ}$ . The mean distance from the point at which it was taken—a little to the west of J. R. G. Finch's, on the Khorarbohr Dhar—to the main range is fifty kilometres. This distance is arrived at by means of the following relevant distances from the viewpoint: Tirich Mir (42 km.), Ghul Lasht Zom (54 km.), Kuh-e-Mandaras (52 km.), Udren Zom (50 km.), Saraghrar (46 km.), and Kuh-e-Tez (56 km.).

### 2. *Instruments and Maps*

The pictures were taken with an Exakta, fitted with a 240 mm. Tele Ennalyt lens, mounted on a tripod. A second set was taken with a  $6 \times 9$  Voigtländer Bessa II.

The half-inch map (1 : 126,720), 1931 edition, was used as the topographical basis for the evaluations, sheets 37 P/SE, 37 P/NE, 42 D/SW, and 42 D/NW being employed. This map corresponded amazingly well, for the most part, with the areas with which I am familiar.

I established, relative to the panorama photographs, the horizontal and vertical angles to a number of summits, twenty-eight of them in the main range, attaching particular weight to the vertical angles. The horizontal angles are mainly useful as aids to the work of identifying the peaks.

The equipment used was the Kern/Aarau miniature theodolite DKM 1 which with its weight of 1.8 kg., and very precise scale readings, is particularly useful for expedition work. I used my photographic tripod with a specially designed fitting such as had already been employed by previous expeditions.

### 3. *Notes on the Altitude Measurements*

The results arrived at are not, of course, values which can be fixed with extreme geodetic precision. This is easily explained by the low

cost of the mini-theodolite. The greatest difficulty was the impossibility of fixing the exact distance to the main summits of the range, for which we had to work out our assessment entirely by the map. In any case, the distances (to the nearest ten metres) do not matter much when the vertical angle is a small one. I shall deal with their calculation in the relevant sections of the panorama. Mostly, the results arrived at were surprisingly good, in spite of these difficulties; but I do not put them forward as a basis for alterations in the established heights as small as two to twenty metres. The real purpose is to correct serious errors.

The individual height-differentials were worked out from the distances yielded by reference to the map, adjusted for the earth's curvature and the normal factor of refraction (the fracture of light). In the absence of any available values, no account could be taken of the force of gravity or of the daily variation of refraction.<sup>5</sup>

I would like to claim a margin of error in the nature of plus or minus twenty-five metres, as against the maximum exactitude which can be expected and registered (by theodolite) of plus or minus ten metres. In the case of a great many peaks this degree of precision was in fact reached.

The altitude of the instrument's position was fixed by reckoning back the difference in height of the main summits, Tirich Mir, Istor-onal, Saraghrar, and a mountain lying to the south of our position. This gave a mean value of 5690 m. for the position, which was on the ridge of Khorabohrt Dhar. This was after my corrected barometric measurement had given it as 5700 m.

The occasional serious differences between altitudes fixed and those previously given were checked by measuring various photographs taken from Noshaq, Nadir Shah, Udren Zom, Shachaur, Kishmi-Khan and Tirich Mir North Peak, among others.

My thanks are due to all those fellow-climbers who so kindly made photographic material available to us. It is certainly no easy thing to lend support to work from which negative altitude corrections may well result in regard to a number of summits gained by great personal efforts. Special thanks must go to my companion on two visits to the Hindu Kush, Dr. Rudolf Pischinger, who was of such great assistance in working out the results obtained and himself carried out much of the work of checking the photographic measurements. And to Dr. G. Brandstätter of the Technical High School in Graz for his advice as to the method used in working out the results and the margin of error.

#### 4. *Epigraphy of the Identification Strip*

The altitude figures have been entered on the strip next to the names of the peaks. The data resulting from the measurements made on

<sup>5</sup> G. O. Dyhrenfurth: *To the Third Pole*, p. 6.

August 8, 1965, have been enclosed in brackets. Previous figures and also those of peaks which were not included in the measurements are given without brackets, e.g. Tirich Mir 7706 (7708). In addition, the figures given on the half-inch map in feet are shown, e.g. 22,000 ft.

### 5. *The Panorama: Description and Notes*

The first prominent mountain at the left-hand end of the photographic strip is Koh-i-Bandakor, 6660 m. There can be no doubt whatever about the identity of the peak. Most visitors to the Hindu Kush will recognise its twin-headed shape either from personal observation or from what they have read.<sup>6</sup>

The reason why J. R. G. Finch failed to identify it either on his journey or in his panorama in 1938 was simply that the peak was at that time not indicated on any map. All the same, a splendid picture, showing this mountain as seen from the Dorah Pass (though anonymously) had already been published in 1936.<sup>7</sup> Finch assessed it at about 22,000 ft. (6706 m.). It was after the Berlin Hindu Kush Expedition of 1960 had climbed the peak that Finch was able to identify it in his classic panorama as Koh-i-Bandakor.<sup>8</sup>

The figure of 6660 m. accepted at that time is below Finch's estimate. The height resulting from my own measurements (the distance factor previously used was too short) is 6752 m. Recent work on the Afghan maps also indicates that the height of Koh-i-Bandakor is more than 6660 m. I heard of this when I met Dr. E. Grötzbach in Afghanistan on my way home.

The glacier next to the east and flowing towards the viewer is the Owir, also recognisable on the old strip but there marked 'Dwir glacier'. The adjoining Tirich Mir group begins with an unnamed mountain marked on the map as 20,200 ft. (6157 m.). It may well rise to the north of the Ojhor Valley<sup>9</sup> on the ridge separating it from the Dirgol glacier, and to the west of the Owir. According to the sketch map made by the German 1935 Hindu Kush Expedition it probably lies to the west of the route by which they climbed Pt. 5900 m. in this group.

Little Tirich Mir, lying between the Owir and the South Barun glaciers is easily recognisable. The last peak before we come to Tirich Mir's main and east summits is the South Glacier Peak, *c.* 6700 m.

Tirich Mir itself shows how uncertain the heights are in this area. The traditionally accepted height of 7750 m. was still so in 1955 and 1960. On the other hand, a height of 7681 m. was quoted in 1936.<sup>10</sup> Heights of 7690 and 7700 m. also crop up in the relevant literature, but

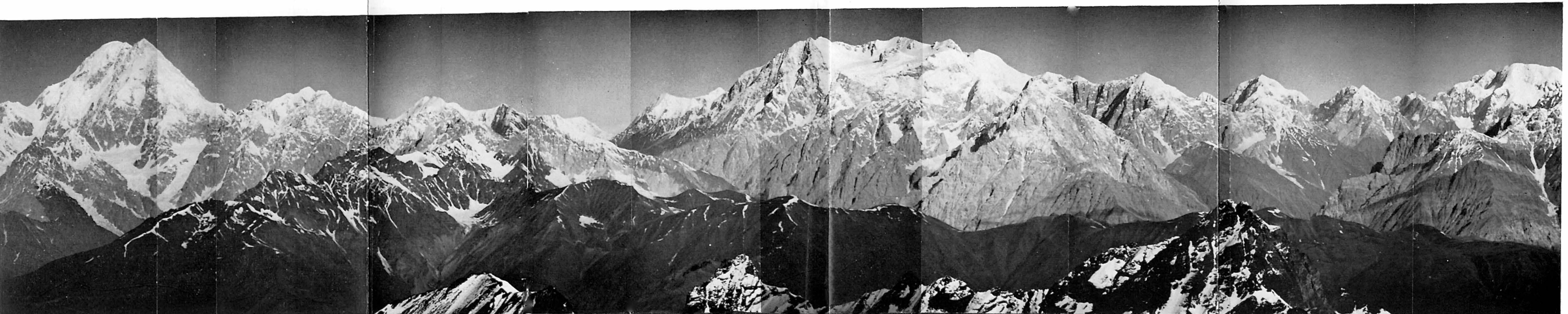
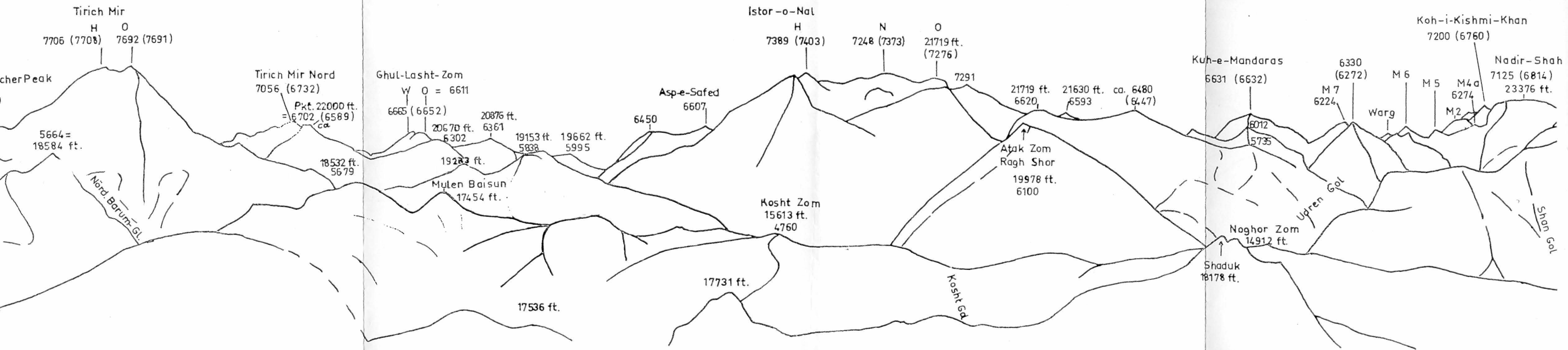
<sup>6</sup> *A.J.* 69.; illus. nos. 66-67.

<sup>7</sup> *H.J.* 8 48.

<sup>8</sup> *A.J.* 68. 137.

<sup>9</sup> *A.J.* 48.; illus. no. 2 after p. 128.

<sup>10</sup> *A.J.* 48. 128.



PANORAMA OF THE HIGH (EASTERN) HINDU KUSH, TAKEN FROM 5690 M. ON KHORABOHR T DAR (BUNI ZOM GROUP).

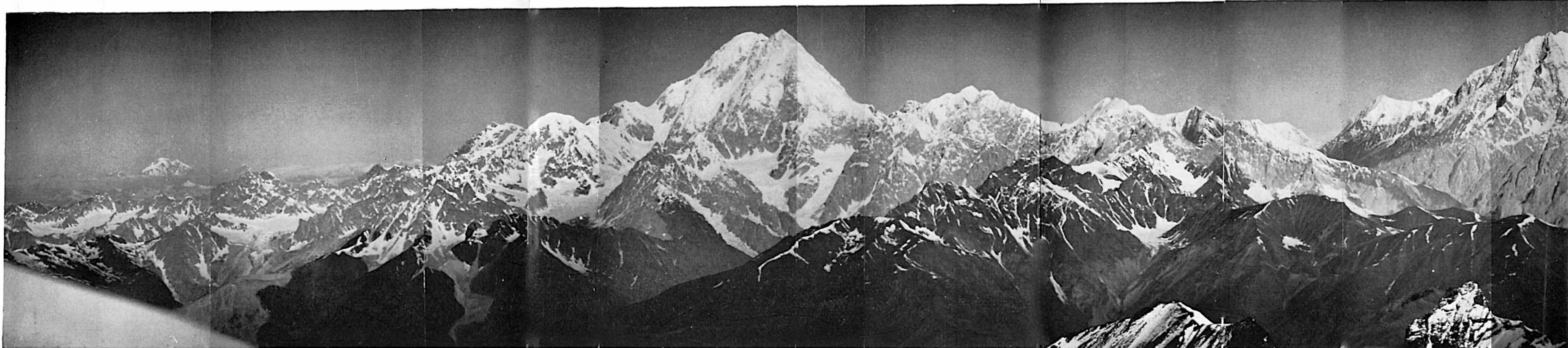
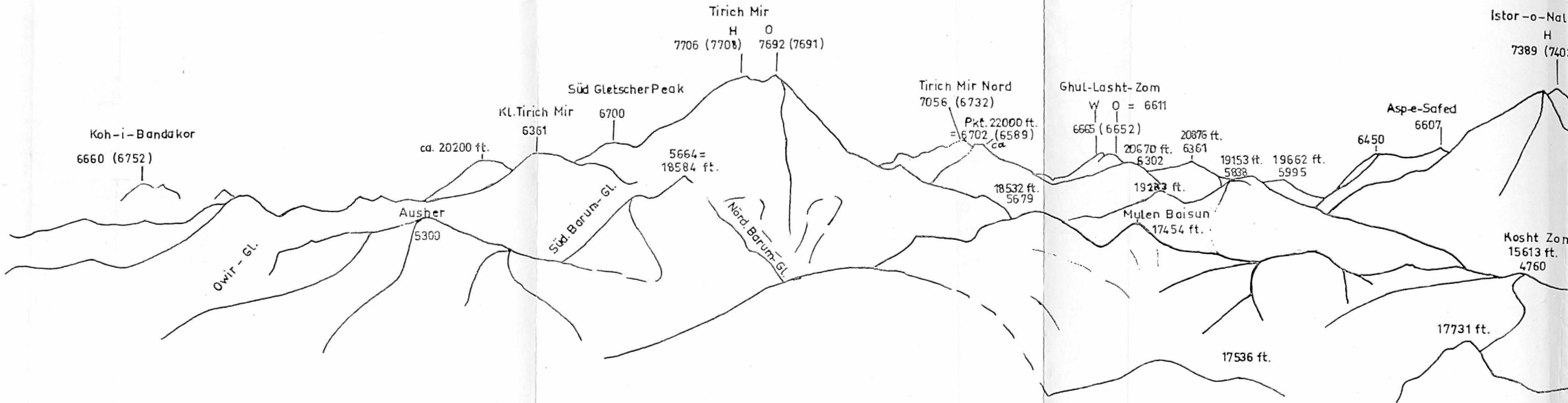
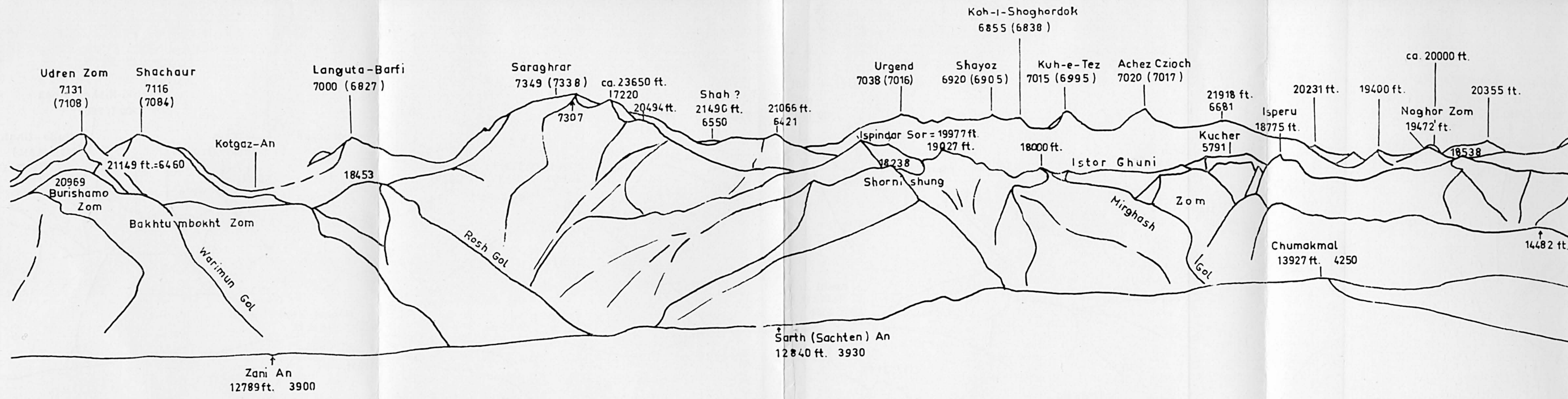
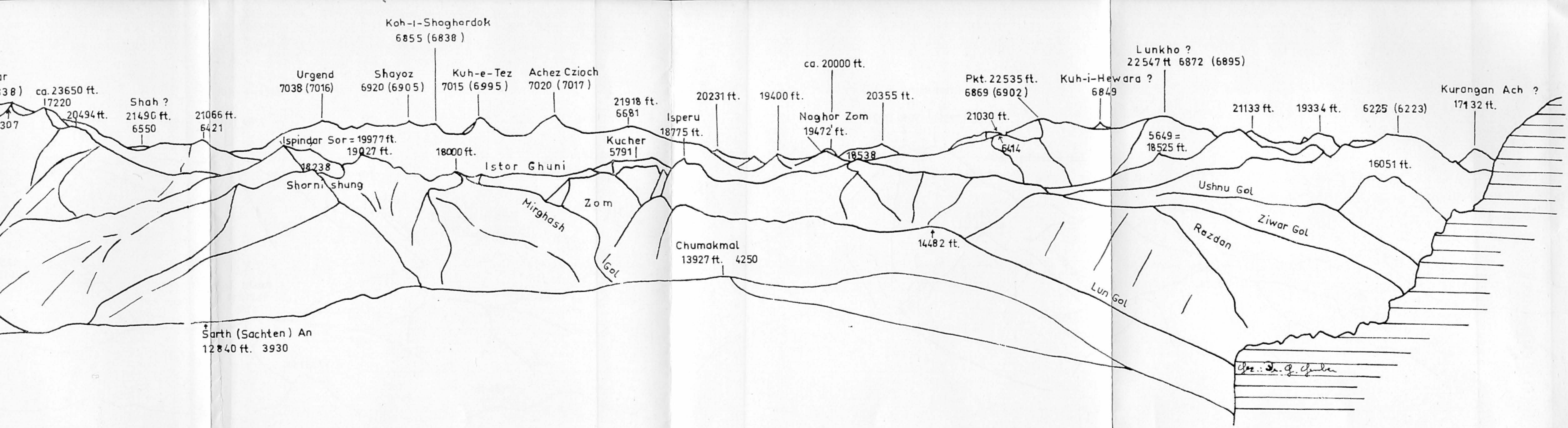


Photo: Dr. G. Gruber]  
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PANORAMA OF THE HIGH (EASTERN) HINDU KUSH, TAKEN FROM 5690 M. ON KHORABOHR T DAR (BUNI ZOM GROUP).



PANORAMA OF THE HIGH (EASTERN) HINDU KUSH—A CONTINUATION OF THE PREVIOUS PICTURE.



PANORAMA OF THE HIGH (EASTERN) HINDU KUSH—A CONTINUATION OF THE PREVIOUS PICTURE.

7706 m. is the figure at present accepted.<sup>11</sup> Our reckoning worked out at 7708 m.

The official evaluation of Tirich Mir East is 7692 m. Here too ours corresponded very satisfactorily: 7691 m.

It was the next peak which brought a great surprise. When I was carrying out the theodolite measurements, I immediately identified it with the 7056 m. summit of the Tirich Mir North group, known for short as Tirich Nord. Our surprise was all the greater when the measurements gave a figure of only 6732 m. It immediately occurred to me that we must be dealing with some different peak, probably Pt. 22,000 ft. (6706 m.), lying further to the east, to which Finch had given the same figure in his panorama.

In an attempt to arrive at an absolutely irrefutable identification of this peak we used our Noshaq pictures,<sup>12</sup> those taken by the 1960 Polish Expedition during their Noshaq climb, and a picture taken on the ascent of Istor-o-Nal.<sup>13</sup> Our last doubts vanished after a telephone conversation with Kurt Diemberger who also definitely identified the peak as Pt. 7056 m. Moreover, the identity of the peak is clearly established by the summit photographs taken when they climbed it<sup>14</sup> in the summer of 1965, kindly lent me by his companion on that occasion, Franz Lindner, the architect.

A close examination of the panorama reveals that the higher peak is a snow summit, falling away to the left in several 'steps' and finally breaking away at a distinctive shoulder to a col below. This place is plainly visible on a published photograph<sup>15</sup> and is also visible, partly obscured, on yet another.<sup>16</sup> The mountain appearing below the snow peak is part of the ridge falling from the North summit of Tirich Mir eastwards and could well be Pt. 22,000 ft. (6706 m.).

A figure of 6773 m. which appears still further to the east on a sketch-map<sup>17</sup> cannot be made to correspond with anything appearing in our picture from Noshaq. Any peak in this position must be lower.

Measurements from the Noshaq picture to check Pt. 7056 m. (Tirich Mir Nord) gave a figure of 6732 m., which happened to correspond to the very metre with our theodolite measurement. The same pictorial measurements produced for Pt. 6706 m. a reading of 6589 m., beyond any question of error.

A check reverse-measurement from Lindner's summit photograph in the direction of Buni Zom gave only 6717 m. for the height of Tirich Nord and this lies within range of its supposed new altitude; though

<sup>11</sup> *Alpinismus*, 1964, no. 10., p. 40. *O.A.Z.* no. 1343, p. 139.

<sup>12</sup> *O.A.Z.* no. 1334, illus. no. 3 after p. 28.

<sup>13</sup> *H.ŷ.* 8. 58.

<sup>14</sup> *A.ŷ.* 71. 61.

<sup>15</sup> *O.A.Z.* no. 1334,; illus. no. 3 after p. 28.

<sup>16</sup> *O.A.Z.* no. 1344, p. 157.

<sup>17</sup> *Ibid.* p. 155.

here the measurement was rendered difficult because the picture was lacking in contrast.

It is interesting in this connexion that, during their first ascent of Tirich Mir's highest summit, the Norwegians spoke of 'drifting clouds a thousand yards below us' (looking towards the north). They would surely have noticed a peak more than 7000 m. high, which would have stuck out of those clouds.

The error in the case of Pt. 7056 m. could, of course, be simply a mistake of a thousand *feet* in the figures. If one subtracts that amount from the old height the metre result comes out at 6751, which coincides extremely well with our calculated figure of 6732 m. At all events, all the mountains in this area seem to be assessed too high, as in the case of Pt. 6706 m. with its more likely height of 6589 m., or thereabouts.

The next twin-summit in the panorama is Ghul-Lasht-Zom, whose height of 6665 m. on the map corresponds well with our theodolite reckoning of 6652 m.

The dome which can be seen close to the East Peak of Ghul-Lasht-Zom (6611 m.) could be Pt. 6302 m.—a summit in the Tirich Mir North group. It is, however, impossible to establish this beyond doubt, since in this sector of the panorama several ranges of the same height lie one behind another. It might also be Pt. 6164 m., also in the Tirich Mir North group; less likely, Pt. 6216 m. on Tirich Mir's East ridge.

The next two peaks are Pt. 6361 m. and Pt. 5995 m., which rise from the ridge bounding the western rim of the Tirich glacier, before we approach the Istor-o-Nal ('Horse-shoe') massif with the spike of Pt. 6450 m. and 6607 m. Asp-e-Safed (which lies to the south of the uppermost Qazi-Deh glacier).

The first tooth in the group, whose rocky precipice faces the viewer, is a spur which thrusts forward to the south-east of the main summit. From the somewhat unclear description given by the party who first climbed Istor-o-Nal<sup>18</sup> this might have been the main summit itself, but this would seem in fact to be the next elevation to it. The ridge which continues to the east of the main summit is separated from it by a col. The official height of the next summit, which dominates the centre of the massif, is 7248 m. My own measurement gives a height of 7373 m. This agrees very well with the observations of the climbers of Istor-o-Nal, who assessed it at about 24,000 ft. (7320 m.). A point rising further to the east along the ridge gave us a measurement of 7276 m., which is broadly in agreement with the old figure of 7248 m. So the old maps may perhaps have confused the position of these two points.

Such an error would also account for Finch's mistake in identifying this peak as Noshaq on his panorama. If Noshaq (7492 m.) could really be seen behind Istor-o-Nal's North summit (7373 m.), its elevation

<sup>18</sup> *H. J. 19. 162.*

would have to be close on 7700 m. Alternatively, Finch must have stood at about 6520 m. if he was to have seen even its tip. But if one goes by the map, as Finch no doubt did, and therefore takes the height of the North peak of Istor-o-Nal as only 7248 m. instead of 7373 m., Noshaq would in fact have been visible from as low down as roughly 5680 m. and certainly from Finch's position. Owing to the great distance he was, of course, unable to make out Istor-o-Nal's topography, which is now clearly recognisable, thanks to the telephoto picture, with exactitude; and he had to go by the map.

The ice peak to the right of the Istor-o-Nal massif, Pt. 7291 m., as well as Pt. 6593 m. (21,630 ft.), rise from the ridge which sinks away eastward from Noshaq. There are further elevations in it before it finally falls from Pt. 6012 m. (19,726 ft.) to the Udren glacier, given as the Atrak glacier on the half-inch map and also on the more recent 1 : 1,000,000. Yet the name Udren has existed in literature since 1936;<sup>19</sup> there is also an old map on which this name is shown for the whole valley, following the usage of the natives, and there is also a note on it to the effect that a party attempted the ascent of Istor-o-Nal by way of the Atrak glacier, known today as the Tirich.<sup>20</sup>

The local inhabitants call the northern arm of the Udren glacier, which flows around the northern end of the ridge, already mentioned as falling eastwards from Noshaq, the Darban. We first heard the name used on our visit in 1964.

Pt. 6620 m. (21,719 ft.) is separated from the East summit of Istor-o-Nal by a deep notch, in a ridge which falls first in an easterly direction, then turns north-eastwards and extends through Pt. c. 6480 m. (21,400 ft., measured by us in 1965 as 6447 m.) to Pt. 5735 m. (18,811 ft.) and from it down to the Udren glacier.

In the foreground, between Pts. 7291 m. and 6620 m. stands Lagh Shor (or Ragh Shor on the map) a 6100 m. (19,978 ft.) peak which Schomberg described many years ago as most attractive. In conversation with us the local people referred to it as Atak Zom, which seems more appropriate than the other two names mentioned, seeing that it towers directly above the summer habitation called Atak.

In the nearer foreground, already on the south side of the Mastuj river stands Pt. 18,178 ft., entered as Shaduk on the map, at no great distance to the north of my viewpoint on the Khorabohrt Dhar. To the north of the Mastuj a long ridge, separating the Tirich Valley from those of Turikho and Mastuj, runs from Mullen Baisun, 17,454 ft., over Kosht Zom 4760 m. (15,613 ft.) and Noghor Zom 4550 m. (14,917 ft.) to Chumakmal 4250 m. (13,927 ft.). This ridge can be crossed by two passes, the 3900 m. Zani An and the Sarth or Sachteen, almost

<sup>19</sup> *A.J.* 48. 303.

<sup>20</sup> *A.J.* 42. 132.

exactly the same height. In the summer the ridge is used as a pasturage.

On the main ridge the next prominent peak is Kuh-e-Mandaras, 6631 m. (6632 m., our measurement). It rises from the Afghan-Pakistan frontier ridge and has been climbed from the Mandaras Valley,<sup>21</sup> a lateral offshoot of the Qazi Deh Valley, at the entrance to the Wakhan. On this same frontier ridge stand Pts. M 7, 6224 m., M 6, M 5, and M 4a, 6274 m.

Pt. 6330 m. (6272 m. our measurement) extrudes southward from the main ridge, to the north of the bifurcation of the Udren and Darban glaciers. It was climbed in 1965 by the South Tirolean Hindu Kush Expedition, who gave it the name of Udren Darban Zom.

The next peak in Finch's panorama, identified by him, is Pt. 23,376 ft., named Koh-i-Nadir Shah after the Second Polish Hindu Kush Expedition climbed it in 1962.<sup>22</sup>

Even in 1963, on Noshaq, we had felt sure that there must be a considerable error in the height accorded to Nadir Shah. During our 1964 visit we established beyond doubt that Shachaur, given as 7116 m., is considerably higher than Nadir Shah, given as 7125 m., and Kishmi-Khan, 7200 m. Yet, at the time, it seemed to me that those two peaks were lower than the accepted figures, not that Shachaur was higher.<sup>23</sup> Our measurements in 1965 confirmed this view. According to them Nadir Shah is only 6814 m., and here again, as in the case of Tirich Mir Nord, it looks like a straight error of 1000 feet. Kishmi-Khan comes off even worse; its height comes out now at only 6760 m.

At first, here too we thought there might be an error in identification, but there was no confirmation of this. In order to save any possibility of a mistake, we took measurements from every available photograph, starting with the present panorama; the vertical angle, here too, is less to Kishmi-Khan than to Nadir Shah. Now, Kishmi-Khan stands entirely in Afghan territory and is therefore not clearly identified on the half-inch map. We therefore transferred its position from Biel's (Polish) sketch-map onto the half-inch. In this matter distance is the most important factor, for if Kishmi-Khan really rises to a height of more than 7100 m.—and the sketch-map laid before the Salzburg Conference on the Hindu Kush by the Poles in 1964 gave it as 7177 m.—the peak, according to the vertical angle, must stand some sixteen kilometres further to the north. This is, however, quite impossible; for in that case, according to the map, it would be in the Ab-i-Panj Valley.

If one assumes, as we did at first, that the mountain is hidden behind Nadir Shah (which is not the case) and relates the vertical angle to that

<sup>21</sup> *A.J.* 68. 121.

<sup>22</sup> *Ibid.*

<sup>23</sup> *The Mountain World*, 1964-65, p. 39.

of Nadir Shah, Kishmi-Khan could not possibly be higher than 6907 m.

A check-measurement from a Noshaq photograph gave 6748 m. The measurement of a summit photograph provided by Rainer Weiss gave 6730 m., using readings to the Main and East summits of Tirich Mir, to Noshaq and to Kuh-e-Mandaras. The pictures taken from Shachaur and Udren Zom are of questionable value for this purpose, on account of the great height differentials over short distances and also because the images overlap.

We ourselves, during our Shachaur climb, always had the feeling that Kishmi-Khan was higher than Nadir Shah; but it is easy to be deceived by the optical illusion by which a mountain rising above considerably lower neighbours gives an impression of being higher than it really is.

It may still be that the distance factors in this case are not absolutely right. It is perfectly possible that Nadir Shah is a little nearer to my viewpoint, conversely Kishmi-Khan further away. If that be so, the differential between the two peaks might shrink to some extent. But, even supposing Kishmi-Khan to be 1.5 kilometres further back to the north, the height would still only be *c.* 6800 m., and so well below the 7000 m. level.

As a result of the new figure Kishmi-Khan loses its undisputed place as the highest mountain on Afghan territory. It will not be till later, when new maps of the Hindu Kush are available, that we shall know whether it or Koh-i-Bandakor will qualify for that honour. It might even go to Kuh-i-Hewara, 6849 m., in the Ishmara Valley of Wakhan.

Other mountains round about Kishmi-Khan also seem to have been given excessive heights on the Polish sketch-map—M 2 is a case in point. In my copy it is marked 6588 m. and the same figure appears in the literature, though elsewhere it is only 6200 m. According to the pictorial measurements it might be as high as about 6400 m. Here, as for the next peak assessed below, my comments rest only on the available photographs, not on any measurements by theodolite.

Koh-i-Warg, officially quoted as 6500 m., is probably also too highly assessed. Our pictorial check-measurements gave us 6136 m. A measurement from the present panorama yielded 6130 m.; another, taken from Sepp Kutschera's summit panorama from Koh-i-Warg, taking a height of 6130 m. as basis, produced heights of 7492 m. for Noshaq and 7400 m. for Istor-o-Nal's main summit, and 7292 m. for Pt. 7291 on Noshaq's East ridge.

A simple comparison, too, of the quoted heights of M 3, 6109 m., Koh-i-Warg and the 'Ridge Crest (*Gratkuppe*) 6100 m.' on Kishmi-Khan's West arête on a panoramic photograph (Noshaq), which can be made because of their similar distances, leaves Koh-i-Warg within the altitude limits already discussed. And on Kutschera's panorama

from the summit of Koh-i-Warg, the 'Ridge Crest 6100 m.' can plainly be seen to be roughly the same height as the point from which the photograph was taken, certainly not 400 m. lower.

Nor can the considerable glaciation of the north side of the 'Ridge Crest 6100 m.', of Koh-i-Warg itself and of Koh-i-Spurditsch (to its west) be adduced as grounds for the higher estimates. As can be seen from our own pictures, mountains like M 9, 6028 m., or M 7, 6224 m., reveal a strongly glaciated northern aspect.<sup>24</sup> On them there is clearly recognisable, on the ridge above the almost snowless south faces, a prominent white rim of snow, indicating that the north face is heavily glaciated. M. Boleslaw Chwaściński, in reply to a query I sent him, kindly informs me that these errors now appear to have been cleared up. The measurements made by the Polish expedition were taken not only from Kuh-e-Mandaras but also from Koh-e-Nadir-Shah. The half-inch map gives an error of over 1,000 ft. in the height of the latter, indicating it as 23,376 ft. as against a correct height of 22,356 ft.

Shachaur, 7116 m. (7084 m. our measurement), and Udren Zom, 7131 m. (7108), the next two peaks in the panorama, have retained their altitudes well within the margin of error. Finch had a clear view of these mountains in his day but failed to identify them.

To the east of Shachaur on the main ridge lies the Kotgaz An, a pass long since disused. Andrzej Wilczkowski, the leader of the 1963 Polish Hindu Kush expedition, described it as a 'big toboggan-run'. Schomberg told how the pass was at one time a regular passage between Chitral and Badakshan, but that icing-up later rendered it impassable. According to him, at the time when the pass was in regular use there were fortifications called 'Darband' here.<sup>25</sup>

In this context, the name of the glacier which flows westwards from the Udren and lies between the Noshaq massif and Kuh-e-Mandaras, takes on an interesting aspect. Our porters called it the Darban, and always maintained that one could cross into Afghanistan that way. This seemed to us very questionable, especially with the equipment available to the local population. It could, however, be that at the time when the Kotgaz An was still usable as a crossing, there was also a way from the Udren Valley into Badakshan. This route must have been protected by 'Darband'. The actual crossing could have been by way of the deep saddle in the main ridge between M 8a and M 9.

The next big peak before we come to Saraghrar is Languta-Barfi, 'the Turban of Snow'. Finch was unable to identify it and marked it, as well as Saraghrar proper, as 'Saraghrar (?)'. It too has to come down from 7000 m. to our corrected figure of 6827 m. Seen from Shachaur it was obviously considerably lower than that 7116 m. summit.

<sup>24</sup> *O.A.Z.* no. 1334, illus. no. 1 after p. 28.

<sup>25</sup> *A.J.* 48. 306-7.

The next giant peak in the panorama is Saraghrar, 7349 m. (7338 m. our measurement). A height of 7350 m. has also been quoted for a point visible to the south of the main summit. If its existence is confirmed, the question arises why it is not regarded as the main summit. A little to the front, to the south-east, lies Pt. 7307 m. and the prominent tooth, *c.* 23,650 ft. (7220 m., and 7184 m. according to us).

Unfortunately the Langar peaks are hidden behind Saraghrar but, in evaluating the Noshaq picture, we took them into account and, according to our results, at least one of them, possibly two, seem justifiably to retain their height of about 7000 m.

The range falls away eastwards of Saraghrar. It is possible that Shah, a 6550 m. (21,490 ft.) summit in the main range, can just be seen pushing up in the extreme background, but this is by no means certain. Certainly Pt. 6421 m. (21,066 ft.) lies further to the south, to the north of the Roma glacier and between the Ushko and Niroghi glaciers, so it cannot be this.

The next peak is Urgend, climbed by the Swiss in 1963.<sup>26</sup> It is undoubtedly over 7000 m. (previous figure 7038 m.; 7016 m. by our measurement).

The two summits which follow are both again linked with Austrian names. Marcus Schmuck and his party climbed Koh-i-Shayoz, 6920 m. (we make it 6905 m.) and Koh-i-Shoghordok, 6855 m. (re-estimated 6838 m. by us) in 1963, both being first ascents.<sup>27</sup>

Before dwindling away to the 6000 m. level the Hindu Kush swings up for the last time to two summits of just on 7000 m. These are Kuh-e-Tez, 7015 m., (6995 m.) and Achez Czioch, 7020 m. (7017 m. our measurement). The latter peak was also identified by Finch as Pt. 23,030 ft. (7020 m.).

Beyond these, identification is doubtful. In this sector a complex of ranges rises one behind the other and makes exact observation difficult. We will, however, make an attempt at it.

The Shornishing and Mirghash Zom peaks, or rather ranges, lie to the north of the Tirich Valley. Behind them the Ispindar Shor chain constitutes the southern boundary of the Niroghi glacier and continues through the Istor Ghuni and Isperu to Pt. 18,538 ft., after which it falls away to the Ziwar Gol.

Kucher, 5791 m. (18,968 ft.), is a solitary peak, rising to the north of Gram Shal in the Ziwar Gol. The Chikar glacier flows around its north-east side, which again is dominated on the north-east by Noghor Zom, 5939 m. (19,472 ft.). The range continues westward to Pt. 6681 m. (21,918 ft.) to the east of Achez Czioch. Between this ridge and the main ridge to the north of it lies the broad expanse of the Kotgaz

<sup>26</sup> *A.J.* 69. 124.

<sup>27</sup> *The Mountain World*, 1964-65, p. 46.

glacier, branching off near Kuh-e-Tez. Other tops on the main ridge are Pt. 20,231 ft., Pt. c. 20,000 ft. and Pt. 20,355 ft. (6208 m.).

Between Pt. 21,030 ft. (6414 m.) and Pt. 18,525 ft. (5649 m.), the Chutidum glacier leaves the lower Kotgaz and sweeps up from a south-westerly direction to a mighty group of peaks (Lunkho?).

It is impossible to identify the mountain behind Pt. 21,030 ft. (6414 m.), which is in Afghanistan. It could be the peak lying in front of the summit marked Lunkho in *Alpinismus*.<sup>28</sup> However, the Czech Hindu Kush Expedition of 1965 seems to have proved that the peak marked Lunkho in the above picture is not Lunkho but Kuh-i-Hewara, 6849 m. And on the present panorama it is quite possibly the peak just seen appearing between the summits 6869 m. (22,535 ft.; measured by us as 6902 m.) and 6872 m. (22,547 ft.; 6895 m. according to us).

What is certain is that none of these peaks has anything to do with the Baba Tangi group, as suggested in the *Alpinismus* picture; for that group rises some thirty to forty kilometres further to the east and, in any case, reaches a maximum height of only 6513 m.

Pt. 6872 (6895) m. could well be Lunkho, but there is no certainty about it. It is, however, interesting that Finch also identified this, the last peak in his panorama, as the one quoted with this height, 22,547 ft.

Pt. 21,133 ft. also belongs to the ridges enclosing the Chutidum glacier, in whose extension eastwards there rises, to the north of the Shahgologh glacier, Pt. 19,334 ft. And finally at the south-eastern corner of that glacier, which sends its waters down to the upper Ushnu Gol, rises Pt. 6225 m. (20,424 ft.; 6223 m. our measurement).

The last peak in the panorama before we reach the West ridge of Buni Zom North Peak is Kuranga Ach, 17,132 ft.

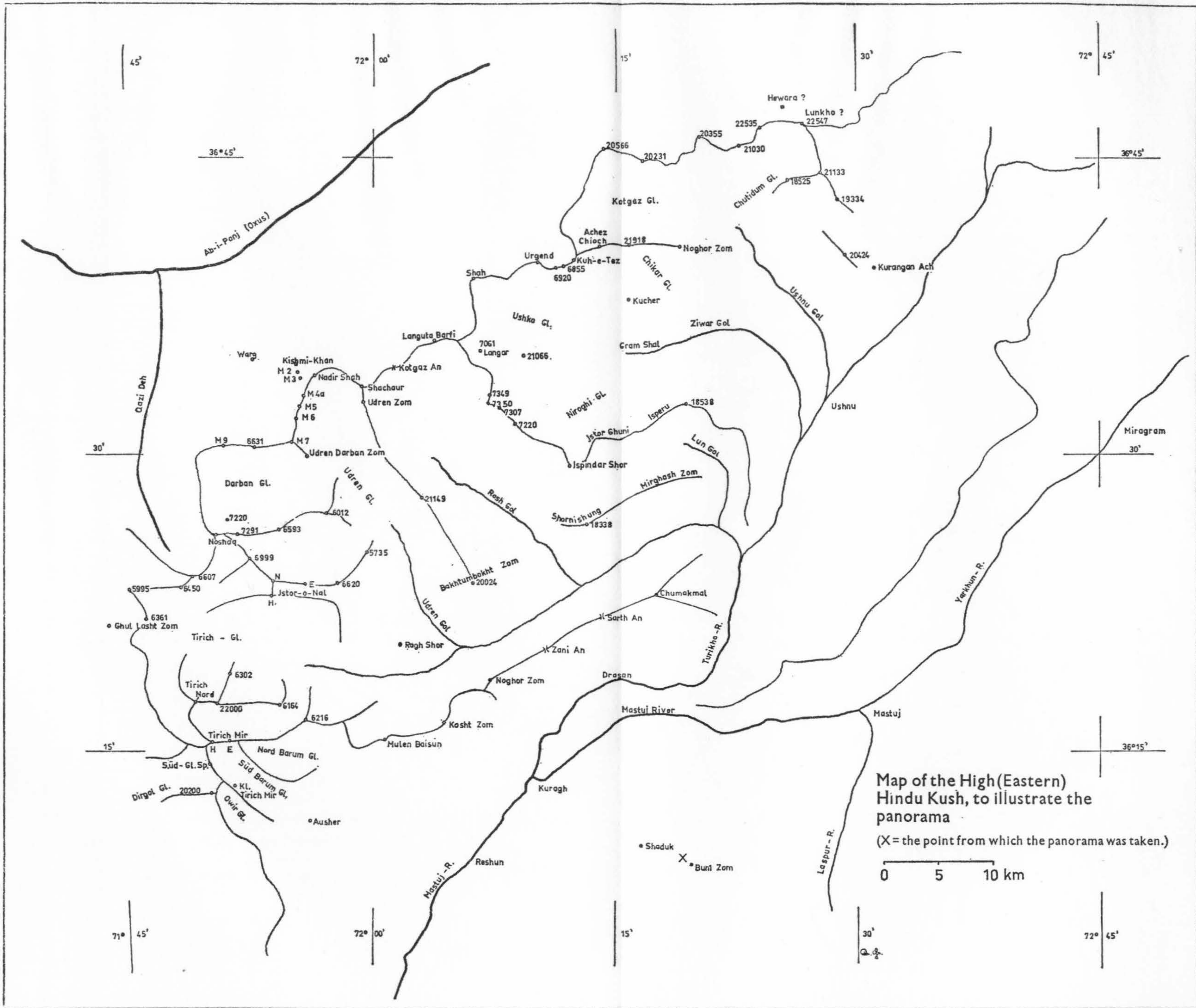
#### SUMMARY

It has been shown that considerable alterations have to be made in the list of peaks previously held to be over 7000 m. in the Eastern Hindu Kush. Till now it has been accepted that there were thirty-two (including three Langar peaks and four in the Tirich Mir West group). Two of the Langar peaks were evaluated as under 7000 m. by the 1964 German Wakhan Expedition, the North and South summits, 6750 m. and 6850 m. respectively. Cutting out these two Langar peaks (though possibly it should be only one of them, see p. 12 above) thirty seven-thousanders are left.

I should like to draw up the balance for the Eastern Hindu Kush as follows in the light of present information:

1. Individual mountains of over 7000 m.: twelve. They are: Tirich Mir, Tirich Mir West group (one peak), Noshaq, Istor-o-Nal, Saraghrar

<sup>28</sup> *Alpinismus*, 1964, no. 12, p. 33.



Map of the High (Eastern) Hindu Kush, to illustrate the panorama

(X = the point from which the panorama was taken.)

0 5 10 km

(highest peak), Pt. 6999 m. (separated from Noshaq and Istor-o-Nal by deep notches and apparently exceeding the invidious figure of 6999 m.), Shachaur, Udren Zom, Langar, (highest peak, 7061 m.), Urgend, Kuh-e-Tez and Achez Czioch. The peak in the Tirich Mir West group, Pt. 6999 m., and Achez Czioch remained unclimbed up to the summer of 1966.

2. To these peaks can be added four which can claim to some extent to be individual mountains of over 7000 m. These are: Tirich Mir East Peak (for the highest and East summits have always been regarded as separate), Darban Zom, 7220 m., Pt. 7291 m. (both of which are in the Noshaq massif) and Istor-o-Nal's North Peak. The last has not yet been climbed.

3. Subsidiary summits, not in themselves individual mountains, over 7000 m., of which there are ten. These are: three elevations in the Tirich Mir West group. Since this group consists of an enormous ridge, I do not think that each of its summits can be regarded as an individual peak, though this awaits clarification when they have been climbed. Also Noshaq's West and East Peaks, and the East Summit of Istor-o-Nal. Then there is the 7040 m. point traversed on the first ascent of Saraghrar's main summit, and also Pts. 7307 m. and 7220 m. rising to the south of that summit. It is not yet absolutely clear whether the quoted height of 7350 m. for a point close to the main summit is correct or not. What is clear is that there are several summits near the Saraghrar massif's main summit which are in fact well over 7000 m. And possibly a point in the neighbourhood of Langar's main summit belongs in this category.

4. Four peaks have lost their seven-thousander status. They are Tirich Mir Nord, Nadir Shah, Koh-i-Kishmi-Khan and Languta Barfi.

So the present position is that there are in the East Hindu Kush the above twenty-six genuine summits of over 7000 m., divided among twelve individual mountains.

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